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CASE STUDY: MARKET VALUE AND USE VALUE APPRAISAL OF AGRICULTURAL LAND FOR PROPERTY TAX PURPOSES IN CLOUD COUNTY, KANSAS

by

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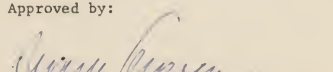

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In Memory of My Grandparents.....

Richard Tilman Titus and his wife Mary Delila devoted a majority of their lives to a never ending task of food production. They retired from the farm in 1968 and moved to town for a brief stay of four years. They returned to the farm in 1972 for the remainder of their lives. Their determination to continue life's challenge will always remain in my memory. They were among my first teachers.

May God Bless their souls.

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CHAPTER I

INTRODUCTION

Historically, modern tax collection evolved for the purpose of providing services and facilities that individuals could not propagate as efficiently. During the latter part of the middle ages, European Kings collected taxes to finance wars. In return, national security was provided to citizens. As modern government developed so did demands of the public for government services. Other functions and rationalizations developed which included regulatory and wealth distribution aspects.[1] However, financing of public services and facilities remains the central purpose of tax collection today.

Once the need for government programs was established, revenues were collected to finance the programs. Two basic philosophies of tax collection developed in modern government. First, taxes should be paid according to a person's ability to pay. Secondly, taxes should be paid according to amount of use or benefit derived from such services or facilities. These philosophies often do not coincide and provide for sufficient argument when tax policy questions arise.

Measures of ability to pay have been employed to fulfill these and other philosophies. Currently three measures of ability to pay compromise over 96 percent of taxes collected in the United States. These measures of ability to pay are income, consumption and accumulated wealth. The taxes, respectively are income, sales or use and property.

Segments of our society possess special interests in terms of the proportion of taxes paid by each measure of ability to pay. Property owners seek to have their property taxes lowered. Income earners seek to have their income taxes lowered. Still others seek to reduce consumption or use taxes.

Government expenditures, historically have rarely been lowered. Therefore, if property taxes are lowered, revenue must be collected by some other form of taxation. As a result the tax burden shifts from one segment of society to another. Because income, sales and property have been the traditional measures of ability to pay, the perennial political tax deliberations are discussions to determine the amount of emphasis to be placed on each measure of ability to pay in the tax mix.[2]

Tax policy is a function of the political process. Elected officials determine the tax mix by majority vote. Educators provide factual information by defining the problem and using scientific analysis to determine the consequences of alternative policy choices.[3]

Value and Market Assumptions

Before property can be taxed it must be appraised for its value. What is value?

Value is what some person believes something is worth. Value is not inherent within an item. Value is created, maintained, modified and destroyed in the minds of men. Value is an opinion of worth or desire.[4]

Value is not the same as price. Price is an amount of money required to transfer ownership of a particular entity from one person to another, at a particular time and place. Value is often idealistic. Price is a real world phenomenon.[5]

Although opinions are personal, the procedures and assumptions used to develop opinions may be similar. Therefore, the appraisal process, a process of ascertaining value, has developed and is based on sets of defined purposes, procedures and assumptions generally accepted by the appraisal profession.

Appraisal of present market value can be based on the assumptions of a competitive real estate market. These assumptions include the following:[6]

1. Buyers and sellers are reasonably knowledgeable about the current real estate market.

2. There exists a number of owners who have been, are currently, and will be willing to sell similar parcels of land. No one owner can influence price.

3. There exists a number of buyers who have been, are currently, and will be capable and willing to purchase similar parcels of land. No one buyer can influence price.

4. The land is on the market for a reasonable length of time during which buyers and sellers have ample time to account for the necessary considerations of determining value and providing for payment.

5. Both buyer and seller are free to participate on a voluntary basis and are not subject to undue pressure or force outside his or her control.

6. The most probable use and potential benefits available, in the short run and to a less degree in the long run, can be ascertained by a typical buyer.

These assumptions often do not accurately reflect the circumstances surrounding sales of agricultural land. Farm real estate markets

are between the extremes of isolated bargaining and highly competitive marketing. There is no central market and land cannot be moved from one place to another. No two parcels are exactly the same in terms of resources, productive capacity and other characteristics. Sometimes only a few buyers and sellers are participating in the market and with little knowledge of land values.[7]

Because the competitive market assumptions often do not accurately portray the circumstances desired in various appraisals, the assumptions may be modified to reflect the appraisal purpose intended. Various values are ascertained by utilizing various sets of definitions, procedures, and assumptions aligned with particular stated purposes of the appraisals.[8]

Fair market value in money is defined in Kansas statutes:[9]

> "Fair market value in money shall mean the amount of money that a well informed buyer is justified in paying and well informed seller is justified in accepting, assuming that the parties thereto are acting without undue compulsion and that the property has been offered at the market place for a reasonable length of time." (See Appendix I.)

In comparing the statute to the competitive real estate market assumptions, some similarities and some differences become clear. Both refer to a reasonable length of time at the market, both refer to undue influence or compulsion, and both refer to willing and knowledgeable buyers and sellers. The statute differs from the competitive market assumptions in that the law makes no reference to the number of buyers and sellers at the market or to the uniformity of land at the market. The statutory terms "justified in paying" and "justified in accepting," imply typical market conditions rather than conditions of a competitive land market.

Kansas statutes continue by listing ten factors that "may be appropriately included" as criteria for determining fair market value. Included are references to classification, size, location, depreciation, reproduction costs, productivity, net income capitalization, rental value, earning capacity, comparable sales, and comparable appraisals.[10] These factors which "may be appropriately included," in criteria allow flexibility on the part of the county appraiser. There are 105 county appraisers in Kansas. It follows that there are as many as 105 different interpretations and methods for ascertaining fair market value in Kansas.

Factors Affecting the Market Value of Agricultural Land

Agricultural real estate prices are influenced by many factors. Buyers and sellers of agricultural real estate do not evaluate these factors uniformly.[11]

Agricultural market value in theory is based on expectations of net benefit derived from future use or ownership. This expected net benefit may be financial in nature or psychic in nature. Expectations of financial benefit are generally profit motivated.[12]

Owners of agricultural land realize financial benefit in two basic forms. Consider a beginning farmer who intends to farm thirty years and whose only source of income is from agriculture. Short run financial benefit is solely from the net income stream from agricultural production.[13] Over a longer run however, the farmer also will realize a net gain or loss on invested capital and land. Income in the latter case will be realized when the capital assets are sold.[14]

What factors affect the financial benefit from ownership or use of agricultural land?

Quality of the soil significantly affects prices paid for agricultural real estate.[15] Soil characteristics including slope, depth, available soil nutrients, and texture partially determine the suitable crops that can be grown and the production potential of a particular parcel. Soil scientists have therefore developed various classification systems for soil characteristic comparison purposes.

Soils with similar profiles are classified into various soil series. Except for different texture in the surface layer, all soils of one series have major horizons that are similar in thickness, arrangement and other characteristics. Each soil series is named for a town or geographic feature near the location where the series was first observed and mapped. Soils of one series may differ in slope, stoniness, texture of the surface layer or other characteristics that affect use. Such differences in characteristics serve as a basis for dividing the soil series into soil phases.[16]

Capability groupings generally signify suitability of soil use for most types of field crops. Capability classification provides some indication as to the limitations when used for field crops, the risk of damage when so used, and the general response to treatment.[17]

Soils used for grassland are grouped into range sites according to the climax vegetation potential. Range site classification provides some indication as to the limitations, risk of damage, and response to treatment of various sites.[18]

Soil surveys provide most of the aforementioned information on soils in a systematic manner. Therefore the surveys may aid in determining the extent to which major soil characteristics affect productive potential and expected financial benefit.

Location affects the market price of agricultural real estate.[19] Location affects the net income stream from agriculture in terms of rainfall, temperature, growing season length, distance from town, road conditions adjacent to fields, water availability, and taxes levied.

In addition to parcel characteristics, management and market factors affect the net income stream from agricultural land. Management determines the use, cropping pattern, tillage operations, quantity of inputs, acres planted, marketing pattern of the product, and the rate of business expansion. Market phenomena determine price of inputs, products and capital investments.

Ascertaining market value of agricultural real estate requires a working knowledge of parcel characteristics affecting production, typical management practices, market trends, and typical expectations in relation to future financial and psychic benefits from owning or using agricultural land.

Use Value Defined

Forty-two states have adopted provisions that allow use value appraisal of agricultural land for property tax purposes. The Kansas Legislature is currently considering the implementation of this form of appraisal for property tax purposes.[20]

A current Kansas proposal House Bill 2732 as proposed by the Interim Committee on Use Value Appraisal (see Appendix I) defines use value as value based on the agricultural income or agricultural productivity attributable to the inherent capabilities of agricultural land in its current usage under a degree of management reflecting median production levels.[21] In this approach, land market conditions have not been specified.

No market is assumed, therefore, use value is not a direct result of the land market. Use value is ascertained only from estimated income or productivity attributable to the inherent capabilities of the soil in its current use.

Value determined by employing income capitalization is estimated according to the following formula.

Value = Net Return ÷ Capitalization Rate Eq. (1.1)

The capitalization rate is an assumed rate of return. The basic differences between market and use values are due to the capitalization rates employed. Net income expressed as a percent of sale price is referred to as the capitalization rate at the market. Capitalization rates determined for recently sold parcels can be applied to net income estimates of similar parcels to estimate market value.[22]

The capitalization rate at the market represents the rate of returns that sellers and buyers require in order to attract the amount of capital needed to transfer ownership.[23] Most Kansas agricultural land is bought for expansion purposes, therefore, the "at the market" rate reflects the risk of purchasing additional land and not the risk of beginning a farming operation or risk of purchasing a parcel as a complete farm unit.[24] The "at the market" rate also reflects future expectations of capital appreciation. These capitalization rates may vary for various types of land if expectations of financial benefit vary.

Capitalization rates determined at the market are not applicable for the use value definition. Capitalization rates employed for tax purposes are determined by the political process. The capitalization rate for value based on income or productivity attributable to the inherent capabilities of the soil will be defined or arbitrarily selected

by policy-makers and may not reflect any factors of land appreciation or risk in a farm expansion situation.

One method of defining capitalization rates for tax purposes is the band of investment method which is based on opportunity costs. Such capitalization rates reflect the market structure being used to finance agricultural real estate. These rates are composites based on the rates of return and relative amounts of each form of capital required to completely finance agricultural real estate investments.[25] The use of property and the purpose of the appraisal typically determine many of the factors which can be employed to build the capitalization rate.[26]

Property Taxes in Kansas

The property tax appraisal serves as a basis for collection and in some cases for distribution of tax revenue.[27] Before the problem of study can adequately be defined, the basic property tax model must be stated relative to tax appraisals.

Property Tax = Appraisal x Assessment Rate x Tax Rate Eq. (1.2)

In Kansas, real and personal property are first appraised according to "fair market value in money." It is then assessed at a rate of thirty percent. Assessed valuation refers to thirty percent of appraised value as listed on a county clerk's tax roll. Various units of government levy taxes on the assessed valuation within their jurisdiction. A property taxpayer's combined tax rate may include school district, county, city, special district, state, and township levies. In 1976, school district, county and city levies accounted for ninety-four percent of the 730 million dollars collected in Kansas property tax revenue.[28]

FOOTNOTES: Chapter I

1. Eric Roll, A History of Economic Thought, 4th ed. (Homewood, Illinois: Richard D. Irwin, Inc., 1974), Chapter 2.

2. B. L. Flinchbaugh, Financing State and Local Government in Kansas, Cooperative Extension Service Bulletin C-451 Revised, (Manhattan, Kansas: Kansas State University, Jan. 1975).

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16. Soil Conservation Service, U.S.D.A., Kansas Agricultural Experiment Station cooperating, Soil Survey of Cloud County, Kansas (Washington, D.C.: U.S. Government Printing Office, October 1976), p. 5.

17. Ibid., p. 36.

18. Ibid.

19. Pine, Effects of Roads, p. 14.

20. Council on Environmental Quality, Untaxing Open Spaces (Washington, D.C.: U.S. Government Printing Office, April 1976), p. 13.

21. Kansas Legislature, An Act Relating to Taxation, House Bill, 2732, Sixty-Seventh Legislature, Regular Session, 1978.

22. Suter, The Appraisal of Farm Estate.

23. Ibid.

24. Pine, Trends in Land Values.

25. Kansas Legislature, Special Committee on Use Value Appraisal, Minutes, July 11-12, 1977.

26. Suter, The Appraisal of Farm Estate.

27. "District Wealth" employed in the School District Equalization Act includes property valuation.

28. Flinchbaugh, Financing State and Local Government.

CHAPTER II

THE PROBLEM

A constitutional amendment permitting the legislature to implement use value appraisal for land devoted to agricultural use was accepted by Kansas voters during the November 1976 general election. Fifty-six percent of the voters favored and forty-four percent opposed the amendment (see Appendix I). The 1978 session of the Kansas Legislature debated and studied implementation.

The problem can be posed in one simple question. How should agricultural land in Kansas be appraised for property tax purposes? There are two basic alternatives: market value or use value.

Symptoms of Fair Market Value

Article eleven of the Kansas Constitution begins, "The legislature shall provide for a uniform and equal rate of assessment and taxation."[1] The Kansas Legislature has established a yearly assessment sales ratio study to determine uniformity in assessment. Actual assessments are compared to sale prices of property that sold in each county. From these ratios statistics which measure uniformity are calculated for each classification and subclassification of property. Commencing in tax years after December 31, 1978, whenever the coefficient of deviation for any classification or subclassification of property within a county is greater than twenty, the director of

property valuation is authorized and directed to order reappraisal for all such property within a county (see Appendix I).

The 1977 Kansas Assessment Sales Ratio Study lists only one county out of 105 with a coefficient of deviation for urban property of twenty or less.[2] Only one county was listed with a coefficient of deviation for rural property of twenty or less. Therefore if the aforementioned statute remains intact, reappraisal will commence January 1, 1979, in most Kansas counties.

The mean most recent reappraisal year was 1967 for Kansas counties. During 1967 to 1976, the estimated market value of all real property in Kansas increased 131 percent based on the ratio study.[3] During this same period, assessed valuation of all real property increased forty-one percent.[4] Improvements and other real property excluding all land accounted for sixty-nine percent of the increased assessed valuation. Clearly land assessments have not kept pace with market value.

Periodically, property is valued by the county appraiser after improvements have been added or after a change in use has occurred. In most counties the assessment of new valuation is currently debased to the level of assessment during the last reappraisal year for the county.[5] This method of debasing assessments theoretically will preserve some uniformity among assessments at an out-of-date level. However, the extent of the impact of debasing assessments on statutory coefficients of deviation has not been determined.

The median of urban property assessments in Kansas decreased to fourteen percent of sale price during 1976. Assessments of rural property

decreased to eight percent of sale price during that same year. It can be concluded that both urban and rural property are not currently assessed at thirty percent of market value, and that rural property is more under assessed compared to sale price than is urban property.[6] If all property were to be reappraised at thirty percent of market value, assessed value for rural property would increase relative to urban property.

Another symptom has been developing on the rural-urban fringe in terms of land use. Development pressure is more intense on agricultural land located next to urban growth centers. Expectations of higher returns in nonagricultural uses create higher land prices for open space on the fringe. In some cases, property taxes, which are based on market value, cannot be readily paid from agricultural income. Forced conversion of agricultural land to other uses may occur due to property taxation.[7]

Use Value Experiences

Three general types of differential appraisal laws are used throughout the United States. They are preferential appraisal, deferred taxation and restrictive agreements. Under preferential appraisal, land devoted to agricultural use is appraised according to value in a specified use. No penalty is levied if the open space is developed. Deferred taxation is similar to the preferential system except a penalty tax is collected if the land changes use. Restrictive agreements are voluntary contracts entered into by landowners and local or state government. Landowners agree to restrict the use of their land in return for tax concessions.[8]

All three basic forms of use value have generally shifted a portion of the tax base to other forms of property, depending on the extent of de facto use value appraisal.[9] A Maryland study shows that the tax rate would have decreased from two to twenty-seven cents per hundred dollars valuation without use value appraisal. Other studies in California and New Jersey indicate similar results.[10]

Use value appraisal generally has not been effective in preserving open space uses, unless combined with other tools for influencing land use. Simple preferential assessment in Colorado may have encouraged development. Speculators can purchase land, lease it to farmers and pay use value taxes while holding the land for development.[11]

If deferred taxes are employed, relatively larger penalties or recoupment taxes may deter conversion to uses other than agriculture. However, land is sold if there is sufficient demand for open space land in other uses--when the price is right.[12]

Restrictive agreements stop the development of open space land under contract for the length of the agreement. However experience in California tends to indicate that most open space land under contract is more than ten miles from the nearest incorporated area. Owners of land near cities, the land most likely to be converted to other uses, did not volunteer for use value appraisal.[13]

Based on previous research at Kansas State University, five general conclusions have been drawn concerning the probable impact of use value appraisal of agricultural land for property tax purposes in Kansas.[14]

1. Use value appraisal will stabilize or increase county taxes per acre of irrigated and dryland. The extent of change depends on the

capitalization rate utilized, the net return per acre, and the current level of assessments. With some exceptions, the increase in county taxes per acre will be less under use value than under market value if the land is reappraised.

2. Use value appraisal will stabilize or decrease the county taxes per acre of grassland. The extent of change depends on the capitalization rate utilized, the net return per acre, and the current level of assessments.

3. Use value appraisal will decrease the county taxes per acre for irrigated, dry and grassland on the rural-urban fringe because of a greater difference between market value and agricultural use value on the fringe.

4. Use value appraisal will partially shift the county tax base from agricultural land to other forms of real property. The extent and direction of change will depend on the alternative capitalization rate utilized and the net returns per acre. The shift will be greater in rural areas than on the rural-urban fringe. The shift is generally infinitesimal on the rural-urban fringe because agricultural land represents a relatively small portion of the tax base. For example, agricultural land in Wyandotte County represents less than two tenths of one percent of total 1976 assessed valuation for the county. If taxes on such agricultural land were to decrease one-hundred percent, little shift would occur to other taxpayers in the county.

In most rural counties, the immediate shift will actually be to agricultural land from other forms of property. This is due to an antiquated level of assessment and de facto use value appraisal.

Current assessments based on out-of-date market value appraisals are lower than estimated use values in many counties.

5. If the formula used to distribute state aid to unified school districts during 1976-77 school year remains intact, use value appraisal would increase general state aid to the districts and shift part of the tax burden from property to sales and income. If a particular school district is at its statutory budget limit, then increased state aid currently must be used to decrease the local school district property tax levy.

If the formula used to distribute state aid to unified school districts is altered to allow general state aid to remain constant at the 1976-77, 211 million dollar level, use value appraisal would shift state aid from districts with relatively small proportions of agricultural land to districts with relatively large proportions of agricultural land. The extent and direction of the shift would also depend on the estimated net returns per acre and the capitalization rate employed to determine use value.[15]

FOOTNOTES: Chapter II

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2. Kansas Department of Revenue, Division of Property Valuation, Kansas Assessment Sales Ratio Study, 1977.

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8. B. L. Flinchbaugh and Mark A. Edelman, Use Value Assessment Case Studies, Cooperative Extension Service (Manhattan, Kansas: Kansas State University, February 1975).

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11. Flinchbaugh, Case Studies.

12. Hady, p. 15.

13. Ibid., p. 11; Carmon, p. 449.

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CHAPTER III

THE STUDY

Objectives of the Study

The purpose of this study is to provide factual information and analysis of the consequences of use value appraisal compared to market value appraisal for tax purposes. Other aforementioned research has documented the impact in other states and estimated the impact on the tax base for each county and school district in Kansas. This study is designed to measure the impact within a taxing unit not among taxing units. More specifically, the objectives of this study are: (1) to measure the impact of various factors, information sources, and methods used for estimating use value net returns, (2) to compare market value appraisal and use value appraisal for a random sample of agricultural investment land in a case county and (3) to compare assessment sales ratios to assessment appraisal ratios for agricultural investment land.

Procedural Outline

A procedural plan was developed to fulfill the stated objectives of the study:

1. Randomly select a sample of agricultural land in a test county.

2. Conduct on-the-spot appraisals based on current fair market value statutes.

3. Estimate use value employing various methods, data sources and capitalization rates.

4. Compare use value to current (1976) valuation on the tax roll and to appraised market value.

5. Calculate and compare assessment sales ratios and assessment appraisal ratios.

County Selection

Cloud County, Kansas was arbitrarily selected as the test county. Consideration was given to rural counties with typical assessment sales ratios. Interested and cooperative county officials--county clerk, county appraiser, and county extension agricultural agent--were desirable for a successful study. Cloud County met these criteria.

Sample Size

The population to be sampled was defined as all agricultural investment parcels of property listed on the county tax roll. Classification of property is determined by the county appraiser in accordance with the law. Agricultural investment property includes land and improvements presently used and operated as units with sources of economic life from the production of agricultural products that originate from land productivity (see Appendix I).

For purposes of determining population variance of the target sample size, it was assumed that assessment sales ratios include sales which are a representative sample of all property.[1] The population variance of 1975 Cloud County rural assessment sales ratios was eight

ratio units. A sample of fifty-five parcels would provide probability slightly greater than ninety percent in detecting a difference of five ratio units between assessment sales and assessment appraisal ratios employing a one tailed, five percent test of significance.[2] Costs of appraisals were also taken into account. The level of confidence provided by a target sample size of fifty-five parcels was arbitrarily selected.

Research Appraiser

A research appraiser was employed for the specific purpose of conducting this study. Originally from Clay County, the appraiser attended and received his Bachelor of Science and Master of Science degrees from Kansas State University in Agricultural Economics in 1937 and 1960, respectively. He served as extension agricultural agent in Hamilton, Cloud and Dickinson counties from 1946 to 1959. He was employed five years in Cloud County during 1947 to 1952. He was appointed Northeast District Extension Economist in farm management and served in that capacity for six years. He served as Kansas State University Section Leader and Extension Economist in farm management from 1966 until retirement in 1974. Since then he has operated a farming enterprise in Riley county and has served as consultant and court witness on various land economics and appraisal studies. He has conducted commercial appraisals and is a member of the Kansas Society of Farm Managers and Rural Appraisers.

The research appraiser began preliminary preparation work and data collection on November 1, 1976. His charge was to assist in gaining the owner's permission to appraise parcels selected in the sample and to conduct the appraisals according to fair market value as defined by Kansas statutes (see Appendix I).

Approval to Appraise

Appraisal request letters which were cosigned by the project director and county extension agricultural agent were sent in six mailings to provide adequate time for the research appraiser to personally contact each owner. Personal visits by the research appraiser were to answer questions about the letter request, to explain the purposes of the study, and to gain the owner's permission to appraise.

Fifty-one parcels were included in the final appraisal sample. Three parcels had been excluded on the basis of current use and identification (see Appendix II). Only one non-resident owner refused appraisal. Fifty-one remaining parcels were considered to be sufficient in terms of sample size for purposes of this study.

The author accompanied the appraiser during nine visits as an observer. Based on personal observations and discussion with the appraiser, four factors regarding the success rate of approval to appraise became clear. Some owners had prior favorable association with Kansas State University and were proud to have been selected for the study. Some owners voiced concern about higher property taxes and included their parcel in order that the facts could become known. Other owners were acquainted and were favorably associated with the project director and county officials involved with the project. Finally, the success of responses was due in major part to the persistance by and the respect for the research appraiser, Wilton Thomas.

FOOTNOTES: Chapter III

1. Robert D. Foster, "An Evaluation of Sales Ratio Studies" prepared for Kansas County Assessors Midsummer Workshop, Manhattan, Kansas: Kansas State University (July 20, 1967), p. 24.

2. George W. Snedecor and William G. Cockran, Statistical Methods, 6th ed. (Ames, Iowa: Iowa State University Press, 1967), p. 111.

CHAPTER IV

MARKET VALUE APPRAISALS

Two traditional techniques were employed to estimate fair market value: comparable sales and income capitalization.

Comparable Sales Data Collection

The research appraiser developed a list of farm real estate sales. These sales were identified by visiting with realtors, loan agencies, bankers, agricultural agency representatives and farm operators within the county (see Appendix II). Each sale was verified for its authenticity of meeting the desired agricultural land market assumptions.[1] Adjustments in sale price were made for time of sale in order to accurately reflect present market value. A pattern of current market values for agricultural real estate by major soil characteristics was established for use on the appraisal sample.

Twenty-two 1976 sales were identified for study. Six sales occurring in 1975 were added to strengthen the geographical and general soil association distribution. One sale occurring February 1977, was also included for study. Twenty-nine sales were identified for use in the appraisal project.

The assessment sales ratio study identifies twenty-five agricultural investment sales occurring during the year ending September 1, 1976.[2] Three of these sales involved parcels with less

than fifteen acres. In terms of numbers, it can be concluded that almost all recent sales of agricultural investment property in the county were identified by the research appraiser.

Values by Comparable Sales

Knowledgeable buyers and sellers consider many factors unique to each parcel to determine the price willingly paid or received. For purposes of establishing a pattern of market values, the research appraiser categorized the major factors affecting value. The desirability of improvements, location, size of field or pasture and production capability were considered major factors contributing to the market value of each parcel.[3] The research appraiser ascertained the portion of consideration attributable to each major factor for the sales sample.

A pattern of market values was estimated for various categories of irrigated, dry, and grassland and for various characteristics within each category. The research appraiser then compared each parcel of the appraisal sample to similar tracts in the sales sample. Similarities and differences in characteristics that affect value were considered. Then the research appraiser assigned a value to each appraisal parcel based on the establishment pattern of market values. The distribution and range of values assigned to both the sales and appraisal samples are summarized in tables 4.1 and 4.2.

Net Income Capitalization

The research appraiser employed the income capitalization method of ascertaining value. This second market value method is based on the following formula.

Market Value = Net Return ÷ Capitalization Rate Eq. (3.1)

TABLE 4.1

IRRIGATED, DRY AND GRASSLAND VALUES PER ACRE FOR SALES AND APPRAISAL SAMPLES--COMPARABLE SALES METHOD

IRRIGATED		DRYLAND			GRASSLAND		
Sales	Appraisals	Sales	Appraisals		Sales	Appraisals	
$1544	$1000	$1009	$1000	$575	$388	$350	$275
1262	900	740	900	575	350	350	275
1230		645	850	525	334	350	275
1081		642	750	525	300	350	275
		583	650	525	300	335	275
		578	650	515	284	300	275
		576	650	510	275	300	275
		550	650	500	275	300	275
		528	650	500	275	300	260
		520	650	490	275	300	250
		519	650	475	266	300	250
		516	650	475	250	300	250
		498	650	475	250	300	250
		473	635	475	250	300	250
		459	625	450	250	300	200
		453	625	450	250	300	200
		429	600	450	200	300	
		403	600	425		300	
		400	600	400		300	
		400	600			290	
		322	590			275	
TOTAL PARCELS	4	2	21	40	17	37	
RANGE OF VALUES	463	100	687	600	188	150	
MEAN VALUE	1279	950	535	589	281	287	
VARIANCE	37373	-	21269	15922	1968	1238	
MEDIAN VALUE	1262	-	519	600	275	300	

TABLE 4.2

FREQUENCY DISTRIBUTION OF VALUES PER ACRE FOR IRRIGATED, DRY AND GRASSLAND--COMPARABLE SALES METHOD

VALUE Categories	IRRIGATED		DRY		GRASS	
	Sales	Appraisals	Sales	Appraisals	Sales	Appraisals
1500-1599	1					
1400-1499						
1300-1399						
1200-1299	2					
1100-1199						
1000-1099	1	1	1	1		
900-999		1		1		
800-899				1		
700-799			1	1		
600-699			2	16		
500-599			8	10		
400-499			8	10		
300-399			1		5	19
200-299					12	18
100-199						
0-99						

During the data collection process, several procedural decisions were made by the research appraiser relating to the crop mix, crop yields, product prices, crop costs, sources of information used, and methods of estimating net returns. The reserach appraiser employed an owner operator's method of estimating net returns to irrigated and dryland investment. It was determined that this approach reflected the prevalent farm business arrangement of the area. The

returns and costs associated with typical owner operator crop management practices were used to develop the cropland budgets.

Market value is affected by the expectations of future benefit from the land. Buyers and sellers of land for agricultural production purposes consider the future income stream for determining the price of land willingly paid or received.[4] To determine expected prices to be used in crop budgets, the research appraiser assumed a three year period into the future. Prices were based on the research appraiser's analysis of the market situation at the time of appraisals, of historic price data,[5] and of price expectations for the years; 1977, 1978, and 1979.

Crop costs used in the budgets were adapted from Kansas State University farm management guide materials.[6] The farm management materials used were developed from actual production costs on farms participating in the Farm Management Association project in cooperation with the Cooperative Extension Service, Kansas State University. The crop budgets were adjusted for local costs, local production levels, projected product prices, typical management practices, and the time period considered. No attempt was made to vary the costs of production for each parcel.

The research appraiser's methods employed a return to management at five percent of gross income per acre, a return to operating capital at nine percent per year for a period of six months, a return to machinery and irrigation equipment investment at six percent of investment, and a return to labor at three dollars per hour based on farm management labor standards.

General guidelines were adopted for assigning crop mixes to each parcel. These guides were consistently assigned to cropland of the sales tracts and of the appraisal tracts. The guidelines were based on historical data and observations of typical cropping practices. During the previous three years, Cloud County averaged 129 thousand wheat acres harvested, 65 thousand acres of grain sorghum, 14 thousand acres of corn and 15 thousand acres of alfalfa.[7] Most of the corn and much of the alfalfa were produced on creek bottom soils. Most of the wheat and grain sorghum was produced on the upland soils. Other crops were produced on limited acres but were considered minor in proportion to crops employed.

Yields were assigned to cropland according to the relative productivity of the predominant soils on each tract. Predicted average yields per acre for principle crops grown under intensive irrigation and dryland management are published in the soil survey for Cloud County.[8] These predicted yields are listed by soil series and phase and served as a basis for the appraiser's yield guidelines listed in table 4.3. In addition to soil survey data, the research appraiser's yield guidelines employed average rainfall and weather assumptions, typical management practices, and historical yield information for Cloud County.[9]

A landlord's net cash rental method was employed by the research appraiser to estimate net returns for grassland in Cloud County. The owner operator method was not used for grass due to the presence of a fairly active cash rental market for grassland in the county.

TABLE 4.3

GENERAL YIELD GUIDELINES EMPLOYED FOR DRYLAND IN CLOUD COUNTY

Soil Type	Wheat bu./acre	Grain Sorghum bu./acre	Alfalfa tons/acre
Predominantly Crete Silt Loam, 1-3% slope	36	65	3.0
Predominantly Crete Silty Clay Loam, 2-6% slope eroded	28	55	-
Predominantly Crete Mixed	33	61	-
Predominantly Hastings Silt Loam, 1-3% slope	34	72	3.5
Predominantly Hastings Silty Clay Loam, 2-6% slope eroded	28	60	-
Predominantly Hastings Mixed	32	67	-
Predominantly Longford Silt Loam, 3-7% slope	30	62	-
Predominantly Longford Silty Clay Loam, 3-7% slope eroded	26	55	-
Predominantly Longford Mixed	28	59	-
Predominantly Armo Silt Loam, 2-7% slope	28	65	-
Hord Silt Loam	34	75	4.0

The reserach appraiser developed budget guidelines for grassland based on historical rental data and local observation of grassland rental practices.[10] Grass rental rates assigned by the research appraiser ranged from ten dollars per acre for the most productive grassland to seven dollars per acre for grassland without adequate water for livestock consumption or adequate size for efficient grazing operations.

The reserach appraiser determined average maintenance, upkeep and property tax costs to be two dollars per acre. No attempt was made to vary costs from parcel to parcel.

Upon completion of data collection, the research appraiser assigned pertinent costs, crop mixes, yields, prices, and rental rates to each individual parcel. Net returns were then estimated for irrigated, dry and grassland contained on each parcel in the appraisal sample.

Values by Income Capitalization

A pattern of capitalization rates at the market were estimated comparing net returns estimated for each sales tract to the portion of sale price attributed to irrigated dry and grassland. Table 4.4 summarizes the market capitalization rates for the sale sample of parcels.

Guidelines used for assigning capitalization rates to irrigated, dry and grassland in the appraisal sample were developed by the research appraiser. These guidelines ranged from 2.0 percent to 3.0 percent for grassland, from 0.75 tc 2.25 percent for below average quality dryland, and from 2.25 percent to 5.0 percent for better than average quality dryland. Estimated net income accounted for 5.0 to 6.5 percent of market value for irrigated land.

Using these guidelines, the research appraiser assigned capitalization rates to irrigated, dry, and grassland for each parcel in the random appraisal sample. Employing the net income capitalization approach, the research appraiser calculated market values for agricultural land on each parcel. Table 4.5 summarizes results of the income approach for estimating market values.

TABLE 4.4

NET RETURNS, MARKET VALUE, AND CAPITALIZATION RATES FOR IRRIGATED DRY AND GRASSLAND--SALES SAMPLE

	IRRIGATED			DRYLAND			GRASSLAND		
	Mkt. Value Per Acre	Net Return Per Acre	Cap. Rate	Mkt. Value Per Acre	Net Return Per Acre	Cap. Rate	Mkt. Value Per Acre	Net Return Per Acre	Cap. Rate
	$1544	$100.05	6.48%	$1009	$40.86	4.05%	$388	$8.00	2.06%
	1262	79.76	6.32	740	24.79	3.35	350	8.00	2.29
	1230	28.91	2.35	654	12.64	1.96	334	7.00	2.10
	1081	71.45	6.61	642	18.81	2.93	300	8.00	2.67
				583	12.48	2.14	300	8.00	2.67
				578	5.72	.99	284	5.00	1.76
				576	6.80	1.18	275	7.00	2.55
				550	18.04	3.28	275	7.00	2.55
				528	10.35	1.96	275	7.00	2.55
				520	15.03	2.89	275	7.00	2.55
				519	10.33	1.99	266	7.00	2.63
				516	15.79	3.06	250	7.00	2.80
				498	6.77	1.36	250	7.00	2.80
				473	10.31	2.18	250	7.00	2.80
				459	4.59	1.00	250	7.00	2.80
				453	6.80	1.50	250	7.00	2.80
				429	6.78	1.58	200	4.00	2.00
				403	3.10	.77			
				400	8.60	2.15			
				400	2.64	.66			
				322	5.80	1.80			
NUMBER OF PARCELS	4	-	-	21	-	-	17	-	-
RANGE	463	71.14	4.26	687	37.76	3.39	188	4.00	1.04
MEAN	1279	70.04	5.44	535	11.76	2.04	281	6.94	2.49
VARIANCE	37373	896.20	4.258	21269	76.51	.8676	1968	1.059	.1081
MEDIAN	1262	79.76	6.48	519	10.31	1.96	275	7.00	2.55

TABLE 4.5

NET RETURNS, CAPITALIZATION RATES, AND MARKET VALUE FOR IRRIGATED, DRY AND GRASSLAND--APPRAISAL SAMPLE

	IRRIGATED			DRYLAND			GRASSLAND		
	Net Return	Cap. Rate	Market Value	Net Return	Cap. Rate	Market Value	Net Return	Cap. Rate	Market Value
	$49.66	5.00%	$993	$50.50	5.00%	$1010	$8.00	2.50%	$320
	44.88	5.00	898	43.32	4.00	1083	8.00	2.50	320
				25.17	3.00	839	8.00	2.25	356
				23.00	3.00	767	8.00	2.75	291
				21.61	3.00	720	8.00	2.50	320
				19.72	3.00	657	7.50	2.50	300
				19.72	3.00	657	7.50	2.25	333
				19.22	3.00	641	7.50	2.50	300
				19.12	3.00	637	7.50	2.25	333
				18.13	3.00	604	7.50	2.50	300
				18.13	3.00	604	7.50	2.50	300
				18.03	2.75	656	7.50	2.50	300
				18.00	3.00	601	7.50	2.50	300
				17.37	2.75	632	7.50	2.50	300
				17.36	2.75	632	7.00	2.25	311
				15.77	2.50	631	7.00	2.50	280
				15.77	2.50	631	7.00	2.50	280
				15.02	2.50	601	7.00	2.00	350
				14.32	2.25	636	7.00	2.75	255
				14.29	2.50	572	7.00	2.00	350
				12.78	2.25	568	7.00	2.00	350
				12.67	2.00	634	7.00	2.00	350
				12.67	2.00	634	7.00	2.50	280
				12.06	2.25	536	7.00	2.33	300
				11.30	2.25	502	7.00	2.33	300
				11.29	2.25	502	7.00	2.00	350
				11.29	2.00	565	7.00	2.33	300
				10.53	2.25	468	7.00	2.50	280
				10.48	2.00	524	7.00	2.50	280
				9.79	2.00	490	7.00	2.50	280
				9.76	2.25	434	6.00	2.50	240
				9.76	2.25	434	6.00	2.00	300
				9.04	2.00	452	6.00	2.25	266
				8.36	2.00	418	6.00	3.00	200
				8.31	2.00	416	6.00	2.50	240
				8.31	2.00	416	5.00	2.00	250
				8.28	2.00	412	5.00	2.00	166
				4.57	1.10	415			
				3.15	0.75	420			
				3.09	0.75	412			
PARCELS	2	-	-	40	-	-	37	-	-
RANGE	4.78	0	95	47.41	4.25	671	3.00	1.00	190
MEAN	47.27	5	946	15.28	2.45	587	7.01	2.40	287
VARIANCE	-	-	-	81.90	.5681	22838	.5623	.06639	1713
MEDIAN	-	-	-	14.29	2.25	601	7.00	2.50	300

Appraised Fair Market Value

In summary, the research appraiser employed three traditional methods of determining market value of agricultural real estate. These approaches, which were developed through the experience of the appraisal profession, included comparable sales and income capitalization methods for land and a cost approach for improvements.

Land value estimation employing the use of comparable sales was conducted by establishing a pattern of land values at the market. For parcels with improvements, timber and wasteland, additional value attributed to these considerations were established and added to the market value of the agricultural land. The net income capitalization method was employed and net returns to land investment were estimated. The pattern of capitalization at the market was established and land values were estimated employing a second method. Identical values for improvements, timber and wasteland were added to earnings values.

The resulting values were compared and a final value established. Final appraised market values were ascertained by weighting the values employing the alternative appraisal techniques. The research appraiser varied weights from parcel to parcel based on his confidence in the data which he had accumulated. Results are included in table 4.6.

TABLE 4.6

MARKET VALUE--COMPARABLE SALES, INCOME CAPITALIZATION AND APPRAISED MARKET VALUE

Acres	Comparable Sales	Income Capitalization	Appraised Market Value
160	$120,000	$122,667	$120,000
160	71,210	72,214	72,000
160	76,500	78,831	78,000
160	103,830	124,472	120,000
160	44,000	44,800	44,000
160	74,100	73,962	74,000
160	52,200	52,387	52,300
160	84,965	84,423	84,500
160	98,750	93,867	98,000
160	100,900	111,802	105,000
158	163,400	163,363	163,400
157	117,050	110,093	115,000
150	96,800	95,219	96,000
150	67,324	66,655	67,250
146	43,800	46,720	46,000
132	47,300	49,802	49,000
82	39,875	45,232	41,000
81	31,330	31,420	31,400
80	47,200	48,069	48,000
80	42,000	42,880	42,250
80	32,800	31,264	32,500
80	49,025	49,600	49,500
80	32,375	32,360	32,360
80	37,330	36,649	37,000
80	29,675	30,400	30,000
80	51,300	51,872	51,300
80	24,000	24,000	24,000
80	51,650	50,149	51,000
79	56,650	59,316	59,000
78	44,700	44,712	44,700
78	50,700	48,955	50,500
78	38,000	39,420	38,250
77	23,100	23,100	23,100
73	47,450	47,985	47,500
64	18,550	18,020	18,500
58	3,625	35,051	36,000
40	17,000	16,435	16,500
40	10,000	9,600	9,600
40	11,000	11,200	11,000
40	18,550	19,111	19,000
40	13,900	14,446	14,250
40	18,330	17,684	18,000
40	14,125	14,780	14,250

TABLE 4.6--Continued

Acres	Comparable Sales	Income Capitalization	Appraised Market Value
40	$ 40,000	$ 40,400	$ 40,400
40	10,400	10,640	10,500
40	21,800	21,949	21,900
36	30,600	30,201	30,500
30	17,250	17,040	17,250
20	6,000	6,400	6,000
6	4,200	4,200	4,200
1	650	636	650

FOOTNOTES: Chapter IV

1. K.S.A. 79.503.

2. Kansas Department of Revenue, Ratio Study, p. 24.

3. Pine, Effect of Roads, p. 14.

4. Leftwich, p. 336; Pine, Trends in Land Values.

5. Kansas Department of Agriculture, U.S.D.A. cooperating, Farm Facts, Kansas State Board of Agriculture, Kansas Crop and Livestock Reporting Service (1976).

6. Department of Economics, K.S.U. Farm Management Guides, Cooperative Extension Service Bulletins MF-261, MF-267, MF-268, MF-271, MF-361, MF-363 (Manhattan, Kansas: Kansas State University, 1976).

7. Kansas Department of Agriculture, Farm Facts (1973-1975).

8. Soil Conservation Service, Soil Survey of Cloud County, p. 38.

9. Kansas Department of Agriculture, Farm Facts.

10. Wilfred H. Pine, and Raymond A. Hancock, Cash Farm Rental Rates in Kansas, Kansas Agricultural Experiment Station Bulletin 594 (Manhattan, Kansas: Kansas State University, January 1976).

CHAPTER V

USE VALUE DETERMINANTS

The purposes of use value appraisal are twofold: tax relief and land use. How much relief and how much open space? These are questions policy-makers face. To achieve social, economic, and political goals, valuation other than the current assessments based on market value may be required. Consider the use value alternative.

Equation 1.1 was employed to estimate use value and is restated here:

Use Value = Net Return ÷ Capitalization Rate Eq. (4.1)

Net return is simply value of production minus expenses. As defined previously, the capitalization rate is an arbitrarily selected rate of return to investment. This concept becomes more complex when additional questions are asked. Whose production and expenses should be used? Which method should be employed to estimate net return? What is a fair capitalization rate?

Various factors were studied in Cloud County. Several alternative methodologies were employed to provide factual information that may aid policy decision-makers. The following list includes the factors employed as variables:

1. Method of net return estimation
2. Sources of yield data and rental rates
3. Sources of crop mix data

4. Crop share leasing arrangements.

5. Periods of years employed to collect product price and production expense data.

Data Sources

Various data sources were reviewed to determine applicability to use value estimation purposes. Table 5.1 includes the sources of data employed.

Price Considerations

Identical sets of product price and crop production cost schedules were employed to estimate all historical net returns. No alternative sources of price and cost data were studied. Alternative price and cost data which were comparable in accuracy to the sources employed, were not available during the study.

Generally a one year lag existed for publishing current data and statistical information. Due to this data lag, the 1975 crop year was employed as the most recent base year for purposes of estimating historical average product prices and crop production costs. Unless on-the-spot data sources are developed, a year lag will exist for use values which are estimated on the basis of the historical net return data sources available. The research appraiser's data is an example of an on-the-spot data source.

A product price schedule was compiled. Product price averages were determined for the various periods of years to be studied. Historical north central Kansas product price data were employed. Three year average expected prices were determined by the research appraiser during the market value appraisal process. The expected prices were based on

TABLE 5.1

SOURCES OF DATA

Data	Source
1. Historical average county yields, product price, crop mix for major crops, and fencing materials costs.	Farm Facts 1966-1975, Kansas Crop and Livestock Reporting Service, Kansas State Board of Agriculture, United States Department of Agriculture.
2. Historical crop production costs and irrigation expense.	Farm Management Summary and Analysis Report 1966-1975, K.S.U. Farm Management Guides 1975-1976, Department of Economics, Kansas State University.
3. Predicted yields, general capability classes, and mapped acreage estimates by soil phase.	Soil Survey of Cloud County, Kansas, 1976, Kansas Agricultural Experiment Station; and Soil Conservation Service United States Department of Agriculture cooperating.
4. Leasing arrangements. . .	Kansas Farm Leasing Arrangements, 1970 Summary, Crop-Share Leases in Kansas 1977, Returns to Cropland and Capital Investment on Kansas Farms 1976, Agricultural Experiment Station and Cooperative Extension Service, Kansas State University.
5. Historical grassland rental rates	Cash Farm Rental Rates in Kansas 1976, Agricultural Experiment Station, Kansas State University; and Kansas Crop and Livestock Reporting Service, cooperating.
6. Property taxes.	Statistical Report of Property Assessment and Taxation 1966-1975, Kansas Department of Revenue, Division of Property Valuation.
7. Assessment sales ratios .	Kansas Assessment Sales Ratio Study 1977, Kansas Department of Revenue, Division of Property Valuation.
8. Assessments	County tax roll, Cloud county clerk's office, Concordia, Kansas
9. Appraisal Data.	As determined February 1977, by research appraiser, Wilton Thomas, past Cloud County Agricultural Agent and retired Farm Management Economist, Kansas State University.

the research appraiser's analysis of historical price data, of the current market situation at the time of appraisals, and of market expectations for 1977, 1978, and 1979. Table 5.2 summarizes the product prices as compiled for study purposes.[1]

TABLE 5.2

PRODUCT PRICES EMPLOYED FOR ESTIMATING NET RETURNS TO CROPLAND INVESTMENT

Period	WHEAT ($/bu.)	GRAIN SORGHUM ($/bu.)	CORN ($ bu.)	ALFALFA ($/ton)
1966	$1.66	$ .99	$1.29	$24.50
1967	1.40	.93	1.10	19.50
1968	1.19	.85	1.02	20.46
1969	1.15	.98	1.13	19.00
1970	1.29	1.09	1.28	23.50
1971	1.31	.89	1.10	23.50
1972	1.65	.81	1.36	25.23
1973	3.54	2.03	2.33	36.50
1974	4.05	3.05	3.47	49.53
1975	3.43	2.25	2.48	49.00
1977-79 Expected Average	2.65	1.95	2.25	50.00
1971-1975 Average	2.80	1.81	2.15	36.75
1968-1975 Average	2.20	1.49	1.77	30.84
1966-1975 Average	2.07	1.39	1.66	29.07

SOURCE: Compiled from "Kansas Farm Facts" 1966-1976, Kansas Crop and Livestock Reporting Service and Research Appraiser's Information.

Crop Budgets

Crop budget guides were designed to show an estimate of production costs and returns for major crops grown in various areas of the state. The budgets selected were applicable to north central Kansas. The budget guides were based on farm operations data from actual farm records and other budget studies.[2] Table 5.3 summarizes costs included for study purposes from the farm management budgets.

A return to operating capital was employed at nine percent interest per year for a period of six months. Operating expenses included seed, fertilizer and lime, herbicide and insecticide, fuel and oil, machinery repairs, custom hire and hauling, drying and miscellaneous expenses. This procedure was adapted from methods employed in the farm management guides.

Averages of actual property taxes were employed to estimate net returns. The estimated averages were compiled for irrigated land bottom, upland, tame grass and native grass in Cloud County.[3]

Landlord's share of expenses included a share of seed, fertilizer and lime, herbicide and insecticide. Also included were drying, interest on operating capital, property taxes, and irrigation equipment depreciation, interest, taxes and insurance. The landlord's expenses were based on previous leasing arrangement studies.[4]

Historical Production Costs

Historical schedules of total crop production costs per acre were compiled for irrigated and dry cropland. Based on the methods and data considerations as employed by Langemeier, average crop production costs were compiled for the 1966-1975 production years.[5]

TABLE 5.3

OWNER OPERATOR'S CROP PRODUCTION COSTS PER ACRE, 1975-76

Cost Item	Continuous Wheat	Dryland Grain Sorghum	Dryland Alfalfa*	Irrigated Corn	Irrigated Alfalfa*
Labor @ $3.00 per hour	5.40	6.90	15.00	7.50	4.50
Seed	5.10	1.00	3.00	15.00	8.50
Fertilizer and Lime	12.50	14.00	7.50	38.00	13.00
Herbicide and Insecticide	1.00	11.50	10.00	22.50	7.00
Fuel and Oil, Machinery	4.75	5.00	6.00	3.50	2.00
Fuel and Oil, Pump, Irrigation	-	-	-	8.00	12.00
Machinery Repairs	6.75	6.75	2.00	10.00	6.00
Custom Hire and Hauling	4.00	-	-	30.00	70.00
Drying	-	.10/bu.	-	.10/bu.	-
Miscellaneous	2.50	2.50	6.00	2.00	2.00
Depreciation on Machinery	11.00	11.00	5.00	8.75	8.75
Machinery Ownership Costs**	6.00	5.50	2.50	3.85	3.85
Depreciation on Irrigation Eq.	-	-	-	10.59	10.59
Irrigation Eq. Ownership Costs**	-	-	-	7.77	7.77

SOURCE: Kansas State University Farm Management Guides, 1975-76.

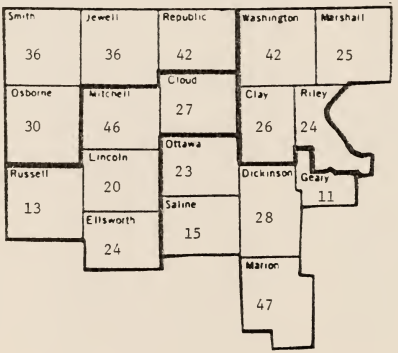
*Alfalfa seed and lime expenses were prorated over four years.

**Ownership costs included interest, taxes and insurance costs.

Farm Management Association I provided a data base. Cloud County is geographically located in the center of the eighteen counties included in this association, as depicted in Figure 5.1. There were 515 farms represented in this association which included 27 farms located in Cloud County.[6]

FIGURE 5.1

FARM MEMBERSHIP IN KANSAS STATE UNIVERSITY FARM MANAGEMENT ASSOCIATION I



SOURCE: KSU Summary and Analysis Report 1975 Association I.

Two schedules were compiled for irrigated and dry cropland. One was based on the owner operator method of estimating net return and the other was based on the landlord's net crop share method. These historical cost schedules are summarized in table 5.4 for dryland.

TABLE 5.4

ESTIMATED AVERAGE DRYLAND CROP PRODUCTION COSTS PER ACRE

Year	Owner Operator Method	Landlord's Net Crop Share Method
1966	$27.50	$4.30
1967	28.43	4.60
1968	30.13	4.81
1969	29.98	5.60
1970	32.23	5.74
1971	35.97	6.25
1972	38.83	6.05
1973	55.46	6.79
1974	62.15	8.97
1975	65.00	9.63
1971-1975 Average	$51.48	$7.54
1968-1975 Average	43.72	6.73
1966-1975 Average	40.57	6.27

Actual average Cloud County property taxes were employed in place of average real estate taxes for Farm Management Association I. Property tax estimates were compiled from 1966-1975 Property Valuation Division data.[7] The schedules employed as historical cost indexes do not include a management return. Both schedules include a return to operating capital at an assumed rate of nine percent interest per year for a period of six months.[8] In addition, the owner operator method includes a return of six percent interest to machinery investment and a return to operator's labor based on 1975 crop labor standards and a three dollar per hour wage rate for all years.[9] Both methods included adjustments for irrigated acres on dryland farms in Association I.

Except for the stated methodology modifications, 1970 through 1974 production cost averages used in the indexes are comparable to the 1970 through 1974 production cost averages for Farm Management Association I as listed in Langemeier's study.[10] Dryland crop production costs for crop years 1975 and 1966 through 1969 were estimated employing the same methodology and data considerations as 1970 through 1974 costs.

Sufficient information to estimate irrigation crop production costs was available for 1973 through 1975 for Association I. The irrigation costs for the preceding years were developed in proportion to the respective dryland crop production costs and therefore were estimated with less confidence and are considerably less accurate. As a result, irrigation crop production costs and irrigation net returns were not estimated for purposes of comparing variable factors affecting use value but were only estimated for purposes of comparing market value to use value for the two irrigated parcels in the appraisal sample.

The same assumptions were employed for irrigated land as were employed for dry cropland. In addition, the owner operator method and landlord's crop share method included a return of six percent interest to irrigation equipment investment for the years estimated. Table 5.5 refers to results of Farm Management Association I irrigation data.

The historical crop cost schedules were applied to the 1975 crop production cost estimates for irrigated and dry cropland on each appraisal parcel. Employing variable factors, historical net returns were estimated for each parcel on the basis of the crop production-cost estimates.

TABLE 5.5

ESTIMATED AVERAGE IRRIGATION CROP PRODUCTION COSTS PER ACRE

Year	Owner Operator Method	Landlord's Net Crop Share Method
1973	$123.58	$15.69
1974	187.25	27.42
1975	168.03	26.54
1973-1975 Average	$159.62	$23.22

Grassland Maintenance Costs

A grassland maintenance cost schedule was compiled from historical fencing and property tax data. It was assumed that area landlords typically provide all fencing and upkeep materials but do not provide labor, if the landlord's net rental method is employed. Fencing costs per acre were estimated for 1966-1975.[11] Material cost estimates per year for fence upkeep were estimated for an assumed eighty acre pasture and depreciated for an assumed twenty-five year period. These arbitrary assumptions were based on local information and were consistently applied for all years and all grassland parcels. Costs per acre were not varied according to pasture size during the market value appraisal process and therefore were not varied during the use value net return estimation process for grassland.

County average grassland property taxes per acre were compiled from 1966 through 1975 Property Valuation Division data.[12] The property

taxes and fencing cost computations were combined to estimate the grassland maintenance costs per acre for Cloud County. The research appraiser applied a two dollar per acre maintenance cost for all grassland based on the future income stream assumptions previously outlined in Chapter IV. Table 5.6 summarizes the grassland maintenance cost schedule as applied in this study.

TABLE 5.6

CLOUD COUNTY AVERAGE GRASSLAND MAINTENANCE COSTS

Year	Maintenance Costs Per Acre
1966	1.47
1967	1.65
1968	1.65
1969	1.83
1970	1.78
1971	1.96
1972	1.87
1973	1.78
1974	2.27
1975	2.13
Expected 1977-79 Average	2.00
1971-1975 Average	2.00
1968-1975 Average	1.91
1966-1975 Average	1.84

Methods

Traditional methods of estimating net return to agricultural land investment were studied. An owner operator net income approach was employed for cropland. The owner operator method estimates net return under the assumption that the operator is also the owner of all property.

A second method that applied to cropland data was the landlord net crop share approach. This method estimates net return under the assumption that the owner of the land does not operate it, but participates in management and shares production and costs.

Landlord net rental income was the final method studied. This method estimates net return under the assumption that the land owner rents his or her land and does not participate in production. Landlord net rental income was determined for grassland only, due to a lack of an active cash rental market for irrigated or dryland in the area.

The methods employed to estimate net return to land investment are outlined as follows:[13]

A. Owner Operator Net Income used for all cropland:

Net Return = Yield X Price Weighted by Crop Mix

Less: - Production Costs Weighted by Crop Mix

Includes: labor, seed, fertilizer and lime, machinery and equipment repairs, herbicide and insecticide, fuel and oil, miscellaneous, and interest on operating capital.

- Fixed Costs

Includes: property taxes, machinery and irrigation equipment depreciation, interest, taxes and insurance costs.

- Management @ 10% of gross crop revenue.

B. Landlord Net Crop Share used for all cropland:

Net Return = Yield X Price Weighted by Crop Mix X Landlord's Crop Share

Less: - Landlord's Crop Share of Production Costs Weighted by Crop Mix

Includes: seed, fertilizer and lime, herbicide and insecticide, conservation and interest on operating capital.

- Landlord's Fixed Costs

Includes: property taxes and irrigation equipment depreciation, interest, taxes and insurance costs.

- Management @ 10% of landlord's gross crop revenue.

C. Landlord Net Rental Income used for all grassland:

Net Return = Landlord's Gross Cash Rent

Less: - Fixed Ownership Costs

Includes: fence depreciation, repairs and property taxes.

- Management @ 10% of landlord's gross cash rent.

The management rate was an arbitrarily selected rate based on current management fee data and practice.[14]

Assuming that owners of agricultural land maximize return to investment, net returns to dryland investment tend to be equivalent regardless of the business arrangement. If various arrangements are not resulting in equivalent returns to investment over time, there would be a tendency for owners to shift to the arrangement resulting in the greatest return to investment or to alter the arrangements to equate returns to investment for the various arrangements. A lag may occur in the latter case.[15]

Effects of alternative net return methods employed for dryland data are compared in table 5.7. Net returns are based on an eight-year average (1968-1975) of product price and production cost data. Yields

TABLE 5.7

EFFECTS OF ALTERNATIVE METHODS OF ESTIMATING NET RETURN TO DRYLAND

General Capability	Parcel	Owner/Operator Net Return/Acre	Landlord Net Return/Acre	Difference
I	1	$39.12	$31.75	$ 7.37
	2	34.36	29.61	4.75
II	3	36.17	24.31	11.86
	4	34.46	23.63	10.83
	5	37.08	24.53	12.55
	6	26.73	21.16	5.57
	7	25.37	19.85	5.52
	8	33.33	24.12	9.21
	9	27.05	21.29	5.76
	10	32.40	23.74	8.66
	11	32.16	23.65	8.51
	12	32.25	23.69	8.56
	13	23.39	19.82	3.57
	14	30.16	22.53	7.63
	15	29.67	22.66	7.01
	16	25.12	20.51	4.61
	17	28.86	22.33	6.53
	18	27.95	21.97	5.98
III	19	28.72	22.27	6.45
	20	26.96	21.57	5.39
	21	25.65	20.73	4.92
	22	27.24	21.36	5.88
	23	24.47	20.57	3.90
	24	26.81	17.35	9.46
	25	23.14	19.72	3.42
	26	24.42	16.56	7.86
	27	19.55	18.29	1.26
	28	19.68	15.10	4.58
	29	18.99	14.75	4.24
	30	23.50	16.25	7.25
	31	21.27	15.51	5.76
	32	19.31	14.86	4.45
	33	20.36	18.61	1.75
	34	24.73	20.36	4.37
	35	22.31	15.86	6.45
	36	24.11	20.11	4.00
	37	16.77	14.14	2.63
	38	21.97	19.25	2.72
IV	39	15.83	13.70	2.13
	40	6.89	10.73	- 3.84
Average		$25.96	$20.22	$ 5.74

employed are soil survey predicted yields as mapped by soil phase, but adjusted by an eight-year (1968-1975) county average yield for each crop. Eight-year averages of data were arbitrarily selected by the interim legislative committee studying use value appraisal. Crop mixes and leasing arrangements employed are those which were assigned to each tract based on parcel characteristics as observed by the research appraiser during market value appraisals.

Parcels are ordered from tracts with the most capability class I land to tracts with the most capability class IV land. The general capability headings--I, II, III, IV--are based on soil survey capability classifications listed for each soil phase and acreage estimates as mapped for each parcel. For example, parcel number one is mapped with more capability class I land than is parcel number two, etc. Also, parcel number two is mapped with more than fifty percent capability class I land, while parcel three is mapped with more than fifty percent capability class II land.

The table indicates that the average net return employing the owner operator net income method is $5.74 higher than the average net return employing the landlord net crop share method. From statistical test results it can be concluded that net returns employing the owner operator method are consistently higher than net returns employing the landlord net crop share method for the time period studied, except for the least capable tracts. There is no significant difference between average net returns employing the alternative methods for the least capable tracts at a ten percent level of significance (see Appendix III; Use Value Methods).

The period studied includes some of the most profitable years on record for dryland in Kansas. More production risk is assumed in

the owner operator method compared to the landlord method outlined for cropland. Therefore, the owner operator method resulted in relatively greater returns in Cloud County during this period. A lagged adjustment in farm business arrangements may occur if the relative difference is not temporary.

Yield Data Sources

Yield data varies by the source of information available. Four types of yield data were studied. Historical estimates of county average yields per acre were employed.[16] An eight-year average (1968-1975) was determined for major crops and was assigned to the parcels.

Second, appraisal yields were assigned to each parcel during market value appraisals. The research appraiser based yield guidelines on soil survey predicted yield data, historical yield estimates, and local information obtained from farmers and agricultural technicians. Yields were assigned to each parcel according to predominant soil type and individual parcel characteristics under the assumption of typical management and average weather conditions.

Third, predicted average yields per acre for principle crops grown under intensive management are listed by soil phase in the soil survey.[17] Predicted yields are general expectations by soil type under average weather conditions. These yields were developed from information obtained from farmers, demonstration plots, research data and agricultural technicians. Predicted yields were weighted by acreage estimates of each soil phase as mapped for irrigation and dryland acres on each parcel.[18]

A fourth yield source was studied to determine the timeliness of predicted yields.[19] This latter source of yield data studied was a combination of the predicted yields which were adjusted by the historical county average yields. County average predicted yields for major crops were determined by weighting each predicted yield by an estimate of the respective soil phase acreage of dryland in the county. Each array of predicted yields by soil phase was adjusted by the percentage difference between the county average predicted yield and the historical eight-year county average estimate. Yields are listed in table 5.8 for major crops employed.

Net returns in table 5.9 employ the four alternative types of yield information. These net returns are based on an eight-year average (1968-1975) of product price and production cost data. The crop mixes and leasing arrangements are those which were assigned to each tract by the research appraiser during market value appraisals.

Similar to table 5.7 parcels are ordered from tracts with the most capability class I land to tracts with the most capability class IV land. General capability headings are also similar to those in table 5.7 and are based on soil survey data.

Four general conclusions can be drawn from the test results. First, county average yields result in underestimated net returns for the more productive land and overestimated net returns for the less productive land. This would be expected from an average yield applied to all parcels.

Second, compared to other sources of yield information, appraised yields tend to account for individual parcel characteristics and

TABLE 5.8

YIELDS FOR MAJOR CROPS INCLUDED IN THE APPRAISAL CROP MIX
BY SOURCE FOR DRYLAND IN CLOUD COUNTY

General Capability	Parcel	Wheat Yields bu.				Grain Sorghum Yields bu.				Alfalfa Yields Tons			
		County Average*	Appraisal	Soil Type Predicted	Soil Type Adjusted	County Average*	Appraisal	Soil Type Predicted	Soil Type Adjusted	County Average*	Appraisal	Soil Type Predicted	Soil Type Adjusted
I	1	35.7	34.0	37.4	38.0	54.5	74.0	75.6	64.3	2.80	3.50	3.78	3.40
	2	35.7	32.0	32.7	35.8	54.5	65.0	70.6	60.0	2.80	3.50	3.54	3.18
II	3	35.7	34.0	38.9	42.6	54.5	65.0	68.3	58.0	-			
	4	35.7	34.0	37.0	40.5	54.5	65.0	71.3	60.6	-			
	5	35.7	38.0	39.2	42.9	54.5	70.0	71.7	60.9	-			
	6	35.7	31.0	31.7	34.7	54.5	66.0	67.6	57.4	-			
	7	35.7	34.0	31.3	34.3	54.5	70.0	68.5	58.2	-			
	8	35.7	35.0	35.9	39.3	54.5	63.0	67.1	57.0	-			
	9	35.7	32.0	32.0	35.0	54.5	62.0	67.4	57.3	-			
	10	35.7	37.0	35.5	38.8	54.5	64.0	66.4	56.5	-			
	11	35.7	37.0	35.4	38.7	54.5	67.0	66.1	56.2	-			
	12	35.7	35.0	35.4	38.7	54.5	63.0	66.2	56.3	-			
	13	35.7	31.0	30.6	33.5	54.5	66.0	63.3	53.8	-			
	14	35.7	32.0	33.8	36.9	54.5	67.0	69.4	59.0	-			
	15	35.7	36.0	34.2	36.4	54.5	64.0	64.2	54.6	-			
	16	35.7	30.0	31.5	34.5	54.5	62.0	64.4	54.8	-			
	17	35.7	36.0	33.8	36.9	54.5	64.0	63.6	54.1	-			
	18	35.7	34.0	33.3	36.4	54.5	62.0	63.2	53.7	-			
III	19	35.7	35.0	33.6	36.8	54.5	67.0	64.0	54.4	-			
	20	35.7	33.0	32.8	35.9	54.5	61.0	62.3	52.9	-			
	21	35.7	30.0	31.9	35.0	54.5	64.0	64.4	54.8	-			
	22	35.7	32.0	32.5	35.6	54.5	67.0	66.3	56.4	-			
	23	35.7	33.0	31.6	34.5	54.5	61.0	60.6	51.5	-			
	24	35.7	30.0	32.4	35.5	54.5	62.0	65.6	55.8	-			
	25	35.7	30.0	30.6	33.5	54.5	62.0	62.5	53.1	-			
	26	35.7	29.0	31.3	34.3	54.5	61.0	63.3	53.9	-			
	27	35.7	31.0	29.3	32.1	54.5	64.0	58.2	49.5	-			
	28	35.7	30.0	29.5	32.2	54.5	60.0	57.2	48.6	-			
	29	35.7	32.0	29.3	32.1	54.5	58.0	57.0	48.4	-			
	30	35.7	29.0	31.0	34.0	54.5	60.0	62.1	52.8	-			
	31	35.7	29.0	30.0	32.8	54.5	62.0	60.1	51.1	-			
	32	35.7	29.0	29.0	31.8	54.5	60.0	58.6	49.8	-			
	33	35.7	31.0	29.8	32.6	54.5	61.0	58.6	49.8	-			
	34	35.7	28.0	30.1	32.9	54.5	64.0	67.9	57.7	-			
	35	35.7	28.0	30.3	33.2	54.5	62.0	61.5	52.3	-			
	36	35.7	29.0	30.7	33.6	54.5	63.0	64.5	54.9	-			
	37	35.7	28.0	28.0	30.6	54.5	57.0	55.0	46.8	-			
	38	35.7	28.0	29.1	31.8	54.5	64.0	64.5	54.8	-			
IV	39	35.7	28.0	27.7	30.4	54.5	57.0	54.4	46.2	-			
	40	35.7	28.0	24.0	26.3	54.5	55.0	45.0	38.8	-			

*(1968-1975).

TABLE 5.9

ESTIMATED NET RETURNS TO DRYLAND EMPLOYING VARIOUS SOURCES OF YIELD INFORMATION

General Capability	Parcel	Owner Operator Net Return/Acre				Landlord Net Return/Acre			
		County Average*	Appraised	Soil Type Predicted	Soil Type Adjusted	County Average*	Appraised	Soil Type Predicted	Soil Type Adjusted
I	1	$28.01	$41.52	$45.19	$39.12	$26.20	$32.95	$34.78	$31.75
	2	28.45	36.87	40.02	34.36	26.66	30.87	32.44	29.61
II	3	25.61	27.70	35.59	36.17	20.09	20.93	24.08	24.31
	4	25.61	27.70	34.31	34.46	20.09	20.93	23.56	23.63
	5	25.26	35.84	38.15	37.08	19.80	24.03	24.95	24.53
	6	26.46	26.67	28.33	26.73	21.05	21.13	21.79	21.16
	7	25.26	31.08	27.08	25.37	19.80	22.13	20.52	19.85
	8	27.21	28.81	31.49	33.33	21.67	22.31	23.38	24.12
	9	26.46	25.82	28.60	27.05	21.05	20.79	21.90	21.29
	10	27.21	32.10	30.59	32.40	21.67	23.62	23.02	23.74
	11	27.21	33.06	30.34	32.16	21.67	24.01	22.92	23.65
	12	27.21	28.81	30.44	32.25	21.67	22.31	22.96	23.69
	13	26.46	26.67	24.79	23.39	21.05	21.13	20.38	19.82
	14	26.46	28.37	31.67	30.16	21.05	21.81	23.13	22.53
	15	27.21	30.61	27.94	29.67	21.67	23.03	21.96	22.66
	16	26.46	23.44	26.49	25.12	21.05	19.84	21.06	20.51
	17	27.21	30.61	27.15	28.86	21.67	23.03	21.64	22.33
	18	27.21	27.00	26.29	27.95	21.67	21.58	21.30	21.97
III	19	27.21	30.08	27.05	28.72	21.67	22.81	21.60	22.27
	20	27.21	25.19	25.32	26.96	21.67	20.86	20.91	21.57
	21	26.46	24.46	26.99	25.65	21.05	20.25	21.26	20.73
	22	26.46	28.37	28.65	27.24	21.05	21.81	21.92	21.36
	23	27.21	25.19	22.93	24.47	21.67	20.86	19.95	20.57
	24	26.46	23.44	28.18	26.81	17.24	16.23	17.81	17.35
	25	26.46	23.44	24.46	23.14	21.05	19.84	20.25	19.72
	26	26.46	21.74	25.73	24.42	17.24	15.66	16.99	16.56
	27	26.46	25.65	20.70	19.55	21.05	20.72	18.74	18.29

TABLE 5.9--Continued

General Capability	Parcel	Owner Operator Net Return/Acre				Landlord Net Return/Acre			
		County Average*	Appraised	Soil Type Predicted	Soil Type Adjusted	County Average*	Appraised	Soil Type Predicted	Soil Type Adjusted
III	28	$26.81	$21.49	$19.58	$19.68	$17.48	$15.70	$15.07	$15.10
	29	26.46	23.78	20.04	18.99	17.24	16.34	15.10	14.75
	30	26.46	21.23	24.76	23.50	17.24	15.49	16.67	16.25
	31	26.46	22.25	22.49	21.27	17.24	15.83	15.91	15.51
	32	26.46	21.23	20.52	19.31	17.24	15.49	15.26	14.86
	33	26.46	24.12	21.49	20.36	21.05	20.11	19.06	18.61
	34	26.46	22.08	26.54	24.73	21.05	19.30	21.08	20.36
	35	26.46	21.06	23.60	22.31	17.24	15.44	16.28	15.86
	36	26.46	22.76	25.58	24.11	21.05	19.57	20.69	20.11
	37	26.81	17.57	16.72	16.77	17.48	14.40	14.12	14.14
	38	26.46	22.08	23.63	21.97	21.05	19.30	19.91	19.25
IV	39	26.46	18.51	16.86	15.83	17.24	14.59	14.04	13.70
	40	26.46	17.49	7.63	6.89	17.24	14.25	10.97	10.73
Average		$26.65	$26.15	$26.60	$25.96	$20.33	$20.28	$20.48	$20.22

*(1968-1975).

limitations not present in published yield data sources. For example, parcels three and four are subject to periodical flooding. This is an individual parcel characteristic not reflected by the predicted or historical yields.

Third, predicted yields by soil phase overestimate the eight-year county average yields for dryland grain sorghum and alfalfa by 14 percent and 10 percent respectively. However, the predicted yield for wheat under-estimates the county average by 9 percent. Therefore, the soil type adjusted net returns tend to increase on parcels that were assigned relatively more wheat and tend to decrease on those assigned relatively more grain sorghum and alfalfa, compared to net returns of predicted yields, unadjusted.

Fourth, if parcels are ordered from tracts with the most capability class I soils to tracts with the most capability class IV soils, net returns employing the soil survey predicted yields do not consistently decrease from high to low returns as expected. This relationship becomes clear upon observation of table 5.10 in which the published predicted yields for each soil phase are grouped according to the respective capability class listed in the soil survey.[20] Class I soils indicate a range of predicted yields that overlap with class II, III, and IV soils for the crops listed. In some instances, class IV soils are listed with predicted yields greater than those listed for soils of a higher capability class. Therefore, it cannot be assumed that all capability class I soils result in higher actual net returns than capability class II, III or IV soils or that all capability class IV soils results in lower actual net returns than soils classed I, II or

TABLE 5.10

SOIL SURVEY PREDICTED YIELDS FOR MAJOR CROPS LISTED BY SOIL SURVEY CAPABILITY CLASSES--DRYLAND IN CLOUD COUNTY

Capability Class	Wheat Yields Bu.	Grain Sorghum Yields Bu.	Alfalfa Yields Ton
Class I	42	80	4
Soil Phases	40	78	4
	34	78	3.5
	34	75	3.5
	32	72	3.5
	32	70	3.5
	24	65	2.5
Class II	42	75	4
Soil Phases	38	74	4
	38	74	3.5
	38	72	3.5
	36	70	3.5
	36	70	3.5
	32	70	3.5
	32	68	3.5
	32	68	3.0
	28	65	2.5
Class III	32	75	3.5
Soil Phases	32	68	3.5
	32	68	3.5
	32	68	3.5
	30	65	3.0
	30	60	3.0
	30	60	2.5
	28	58	2.5
	28	55	2.5
	28	55	2.5
	26	52	2.0
Class IV	28	60	4
Soil Phases	28	55	3
	24	45	2.5

SOURCE: Soil Survey of Cloud County Kansas, Soil Conservation Service, USDA in cooperation with Kansas Agricultural Experiment Station.

III. If general capability classes as outlined and applied in soil surveys are employed to gauge capability for tax purposes, it must be recognized that each capability class may contain an overlapping range of actual net returns (see Appendix III; Yield Source).

Sources of Grassland Rental Rates

Two sources of grassland cash rental rates were available for study. Appraisal cash rental rates were determined by the research appraiser during the market value appraisals. The appraisal rental rates were based on historical rental data, individual parcel characteristics and observation of local grassland rental practices.

A second source of rental data was historical county average cash rental rates. This historical data is collected annually for the North-Central Crop Reporting District. An eight-year county average (1968-1975) was employed for comparison of net returns.[21]

Appraisal rental rates were also adjusted by the historical eight-year county average rental rate for comparison purposes. Net returns were estimated employing an eight-year average (1968-1975) of expense and property tax data. Table 5.11 includes the results.

Grassland parcels are ordered from tracts with the most production potential to those with the least production potential based on soil survey range site classifications. Net return differences are also listed. A negative difference indicates that the net return employing the county average rental rate is lower than that which employs the appraisal rate adjusted. A positive sign indicates that the county average return is relatively higher.

Tracts with the most production potential do not necessarily merit the highest net returns as would be expected if

TABLE 5.11

ESTIMATED NET RETURNS TO GRASSLAND EMPLOYING ALTERNATIVE SOURCES OF CASH RENTAL RATES

Parcel	Landlord Net Return/Acre		
	County Average Cash Rent*	Appraised Cash Rent	County Average Difference**
1	$4.06	$4.24	$- .18
2	4.06	3.38	.68
3	4.06	4.05	.01
4	4.06	3.38	.68
5	4.06	4.05	.01
6	4.06	4.05	.01
7	4.06	4.05	.01
8	4.06	4.24	- .18
9	4.06	2.72	1.34
10	4.06	4.05	.01
11	4.06	4.38	- .32
12	4.06	4.05	.01
13	4.06	4.38	- .32
14	4.06	4.38	- .32
15	4.06	4.71	- .65
16	4.06	4.71	- .65
17	4.06	3.25	.81
18	4.06	2.72	1.34
19	4.06	4.05	.01
20	4.06	3.91	.15
21	4.06	4.05	.01
22	4.06	3.25	.81
23	4.06	4.71	- .65
24	4.06	3.38	.68
25	4.06	4.38	- .32
26	4.06	4.24	- .18
27	4.06	3.38	.68
28	4.06	4.05	.01
29	4.06	4.38	- .32
30	4.06	4.38	- .32
31	4.06	4.05	.01
32	4.06	4.24	- .18
33	4.06	2.72	1.34
34	4.06	4.05	.01
35	4.06	4.57	- .51
36	4.06	4.57	- .51
37	4.06	4.24	- .18
Average	$4.06	$3.98	$-0.08

*(1968-1975).

**Spearman's correlation coefficient is not significantly different from zero at a ten percent level of significance.

rental rates varied by range site classes based on production potential. Likewise, tracts with lower potential do not necessarily merit lower returns. It can be concluded that range site classes, which are listed by soil phase and are designed to reflect general production potential, do not accurately reflect current rental potential as determined by the research appraiser. The results tend to indicate that pasture size, current range conditions, management, and other individual parcel characteristics provide more of a basis for assigning rental rates than does range site production potential classes. If the goal of the appraisal for tax purposes is to value the inherent capabilities of the soil, then the county average net rental is an approximate measure of actual net return to grassland over all range sites.

Crop Mix Data Sources

Two sources of crop mix data were studied. A historical county average crop mix was determined from Kansas Crop and Livestock Reporting Service acreage data (1968-1975).[22] The county average mix assigned to all dryland includes 63.5 percent wheat, 26.7 percent grain sorghum and 9.8 percent alfalfa.

The second source of crop mix data was determined by the research appraiser during market value appraisals. One of four appraisal crop mixes was assigned to dryland on each parcel based on soil characteristics and typical cropping practices as observed by the research appraiser. The four appraisal mixes are as follows:

A. 33.3 percent wheat, 33.3 percent grain sorghum, 33.3 percent alfalfa

B. 60 percent wheat, 40 percent grain sorghum

C. 67 percent wheat, 33 percent grain sorghum

D. 75 percent wheat, 25 percent grain sorghum

Net returns were estimated employing the alternative crop mix data for dryland. Effects of alternative crop mix data are compared in table 5.12. Net returns are based on an eight-year average (1968-1975) of product price and production cost data. Yields employed are soil survey predicted yields as mapped by soil phase and adjusted by an eight-year (1968-1975) county average yield for each crop. Leasing arrangements employed are those which were assigned to each tract by the research appraiser during market value appraisals.

Similar to previous tables, parcels are ordered from tracts with the most capability class I land to tracts with the most capability class IV land. The general capability headings are also similar to previous tables and are based on soil survey data. The mix code--A, B, C, D--signifies the appraisal crop mix assigned to each particular parcel.

Net return differences employing the alternative crop mix data sources were determined. A negative sign indicates that the county average crop mix yields a lower net return than the appraisal crop mix. A positive sign indicates that the net return based on the county average crop mix is higher than that which is based on the appraisal crop mix.

Test results indicate that the magnitude of net return differences depends upon the particular appraisal mix assigned to the parcel (see table 5.13). Appraisal mix "A" results in net returns greater than those resulting from the county average crop mix. This is due to a relatively higher percentage of alfalfa included in appraisal mix A. Appraisal

TABLE 5.12

ESTIMATED NET RETURNS TO DRYLAND EMPLOYING ALTERNATIVE CROP MIXES

General Capability	Parcel	Mix Code	Owner Operator Net Return/Acre			Landlord Net Return/Acre		
			County* Average Mix	Appraisal Crop Mix	Difference	County* Average Mix	Appraisal Crop Mix	Difference
I	1	A	$34.51	$39.12	$-4.61	$30.26	$31.75	$-1.49
	2	A	30.17	34.36	-4.19	28.33	29.61	-1.28
II	3	C	37.23	36.17	1.06	24.70	24.31	.39
	4	C	35.90	34.46	1.44	24.17	23.63	.54
	5	B	40.14	37.08	3.06	25.87	24.53	1.34
	6	B	28.15	26.73	1.42	21.84	21.16	.68
	7	B	26.82	25.37	1.45	20.54	19.85	.69
	8	D	33.81	33.33	.48	24.10	24.12	- .02
	9	B	28.65	27.05	1.60	22.04	21.29	.75
	10	D	32.35	32.40	- .05	23.52	23.74	- .22
	11	D	32.34	32.16	.18	23.52	23.65	- .13
	12	D	32.69	32.25	.44	23.66	23.69	- .03
	13	B	24.47	23.39	1.08	20.37	19.82	.55
	14	B	31.45	30.16	1.29	23.16	22.53	.63
	15	D	30.04	29.67	.37	22.59	22.66	- .07
	16	B	26.12	25.12	1.00	21.03	20.51	.52
	17	D	29.21	28.86	.35	22.26	22.33	- .07
	18	D	28.39	27.95	.44	21.94	21.97	- .03
III	19	D	29.12	28.72	.40	22.23	22.27	- .04
	20	D	27.29	26.96	.94	21.50	21.57	- .07
	21	B	27.00	25.65	1.35	21.38	20.73	.65
	22	B	28.63	27.24	1.39	22.03	21.36	.67
	23	D	24.80	24.47	.33	20.50	20.57	- .07
	24	B	28.30	26.81	1.49	17.94	17.35	.59
	25	B	24.73	23.14	1.59	20.47	19.72	.75
	26	B	25.94	24.42	1.52	17.16	16.56	.60
	27	B	20.54	19.55	.99	18.80	18.29	.51

TABLE 5.12--Continued

General Capability	Parcel	Mix Code	Owner Operator Net Return/Acre			Landlord Net Return/Acre		
			County* Average Mix	Appraisal Crop Mix	Difference	County* Average Mix	Appraisal Crop Mix	Difference
III	28	C	$20.38	$19.68	$ .70	$15.31	$15.10	$ .21
	29	B	20.06	18.99	1.07	15.20	14.75	.45
	30	B	24.99	23.50	1.49	16.84	16.25	.59
	31	B	22.66	21.27	1.39	16.07	15.51	.56
	32	B	20.19	19.31	.88	15.24	14.86	.38
	33	B	21.69	20.36	1.33	19.26	18.61	.65
	34	B	26.37	24.73	1.64	21.13	20.36	.77
	35	B	23.78	22.31	1.47	16.44	15.86	.58
	36	B	25.68	24.11	1.57	20.85	20.11	.74
	37	C	17.38	16.77	.61	14.31	14.14	.17
	38	B	23.80	21.97	1.83	20.10	19.25	.85
IV	39	B	17.06	15.83	1.23	14.20	13.70	.50
	40	B	8.97	6.89	2.08	11.51	10.73	.78
Average			$26.80	$25.96	$ .84	$20.56	$20.22	$ .34

*(1968-1975).

TABLE 5.13

DIFFERENCES BETWEEN NET RETURNS EMPLOYING THE COUNTY AVERAGE MIX AND NET RETURNS EMPLOYING THE APPRAISAL CROP MIX GROUPED BY APPRAISAL MIXES FOR DRYLAND

Mix	Appraisal Crop Mixes	Parcel	Difference From County Average Net Return	
			Owner/Operator's	Landlord's
A	33% Wheat,	1	-4.61	-1.49
	33% Grain Sorghum,	2	-4.19	-1.28
	33% Alfalfa			
B	60% Wheat,	5	3.06	1.34
	40% Grain Sorghum,	6	1.42	.68
	0% Alfalfa	7	1.45	.69
		9	1.60	.75
		13	1.08	.55
		14	1.29	.63
		16	1.00	.52
		21	1.35	.65
		22	1.39	.67
		24	1.49	.59
		25	1.59	.75
		26	1.52	.60
		27	.99	.51
		29	1.07	.45
		30	1.49	.59
		31	1.39	.56
		32	.88	.38
		33	1.33	.77
		34	1.64	.77
		35	1.47	.58
		36	1.57	.74
		38	1.83	.85
		39	1.23	.50
		40	2.08	.78
C	67% Wheat,	3	1.06	.39
	33% Grain Sorghum,	4	1.44	.54
	0% Alfalfa	28	.70	.21
		37	.61	.17
D	75% Wheat,	8	.48	- .02
	25% Grain Sorghum,	10	- .05	- .22
	0% Alfalfa	11	.18	- .13
		12	.44	- .03
		15	.37	- .07
		17	.35	- .07
		18	.44	- .03
		19	.40	- .04
		20	.94	- .07
		23	.33	- .07

mixes B, C and D contain progressively more wheat and less grain sorghum. The results indicate that net returns employing the appraisal mix are lower than those employing the county average mix when relatively higher percentages of grain sorghum and lower percentages of wheat are included in the appraisal mix (see Appendix III; Crop Mix).

Average net return differences resulting from the alternative crop mixes were less than a dollar for both the owner operator method and the landlord net crop share method.

The results of statistical tests indicated significant change in net return differences over the various capability classes at a ten percent level of significance. The net return differences resulting from the alternative crop mix data sources did not vary by general capability. Therefore, the results indicate that individual parcel characteristics other than capability classes provided basis for assigning appraisal crop mixes. However, if actual crop mixes do in fact vary by capability, then test results would be due to the general nature of capability classes as mapped in the soil survey or to possible research bias. In any event, it can be concluded that a historical county average crop mix is an approximate measure of the actual crop mix over all general capability classes for the time period studied.

Leasing Arrangements

Two methods for assigning leasing arrangements were studied for the landlord net crop share method employed for dryland. Appraisal leasing arrangements were assigned to each parcel according to parcel

characteristics and local observation of landlord leasing practices. Each parcel was assigned one of three crop share leases: 50 percent, 40 percent, or 33 1/3 percent share to the landlord. The second approach was to assign the most typical landlord lease in the area to all dryland parcels. It was determined that the most typical leasing arrangement in Cloud County was a 40 percent share to the landlord.[23]

Net return estimates in table 5.14 are based on an eight-year average of yield, product price and production cost data. Appraisal crop mixes and predicted soil type adjusted yields were also employed. Parcels are ordered as in previous tables according to soil survey capability classes. Net return differences were determined. A negative sign indicates an appraisal arrangement of 50 percent to the landlord. A positive sign indicates an appraisal arrangement of 33 1/3 percent to the landlord.

The results indicate that the leasing practice in Cloud County is to vary the arrangement by capability class. Therefore, employing one constant leasing arrangement results in underestimation of actual appraised net return for more capable soil classes and in overestimation of actual appraised net return for less capable soil classes. It can be concluded that the constant lease is not an approximate measure of actual appraisal leases over all capability classes. (See Appendix III; Leasing Arrangements.)

Time Period Selection for Data Collection

Four time periods for data collection were studied: five-year average (1971-1975), eight-year average (1968-1975) and ten-year

TABLE 5.14

ESTIMATED LANDLORD'S NET RETURN TO DRYLAND EMPLOYING ALTERNATIVE METHODS OF ASSIGNING LEADING ARRANGEMENTS

General Capability	Parcel	Landlord Net Return/Acre: Constant Arrangement	Landlord Net Return/Acre: Appraisal Arrangements	Difference
I	1	$24.82	$31.75	$-6.93
	2	23.20	29.61	-6.41
II	3	24.31	24.31	-
	4	23.63	23.63	-
	5	24.53	24.53	-
	6	21.16	21.16	-
	7	19.85	19.85	-
	8	24.12	24.12	-
	9	21.29	21.29	-
	10	23.74	23.74	-
	11	23.65	23.65	-
	12	23.69	23.69	-
	13	19.82	19.82	-
	14	22.53	22.53	-
	15	22.66	22.66	-
	16	20.51	20.51	-
	17	22.33	22.33	-
	18	21.97	21.97	-
III	19	22.27	22.27	-
	20	21.57	21.57	-
	21	20.73	20.73	-
	22	21.36	21.36	-
	23	20.57	20.57	-
	24	21.19	17.35	3.84
	25	19.72	19.72	-
	26	20.23	16.56	3.67
	27	18.29	18.29	-
	28	18.49	15.10	3.39
	29	18.06	14.75	3.31
	30	19.87	16.25	3.62
	31	18.98	15.51	3.47
	32	18.19	14.86	3.33
	33	18.61	18.61	-
	34	20.36	20.36	-
	35	19.39	15.86	3.53
	36	20.11	20.11	-
	37	17.33	14.14	3.19
	38	19.25	19.25	-
IV	39	16.80	13.70	3.10
	40	13.23	10.73	2.50
Average		$20.81	$20.22	$ 0.59

average (1966-1975). The length of these three periods correspond with legislative committee proposals.[24] In addition, the period assumed for the market value appraisals was considered. Buyers and sellers of land for agricultural purposes consider the future income stream from agricultural production to determine price of land willingly paid or received. The research appraiser assumed a three year period into the future (1977-1979) for estimating product price and production cost expectations during market value appraisals. The appraised future income stream as determined by the research appraiser was selected to provide an estimate of use value based on current (1977-1979) income stream expectations.

Net returns for dryland employing the various periods of years were estimated and are listed in table 5.15. Net returns except for the appraised future income stream alternative, are based on appraisal crop mixes, predicted yields by soil phase adjusted and appraisal leasing arrangements. Appraisal yields are employed for the appraised future income stream alternative. Parcels are ordered according to soil survey general capability classes.

Net returns for grassland employing the various periods of years were estimated and are listed in table 5.16. Net returns are based on appraisal rental rates adjusted by historical county average cash rental rates for each period of years studied. Parcels are ordered according to production potential based on soil survey range site classifications as mapped by soil phase.

The results indicate that longer periods of historical data currently result in lower net returns for dryland in Cloud County. However, if future income streams are relatively low compared to

TABLE 5.15

ESTIMATED NET RETURNS TO DRYLAND EMPLOYING ALTERNATIVE PERIODS OF YEARS FOR ESTIMATING YIELDS, PRICES, AND PRODUCTION COSTS

General Capability	Parcel	Owner Operator Net Return/Acre				Landlord Net Return/Acre			
		Appraised Future Income Stream	Historic Five-Year Average	Historic Eight-Year Average	Historic Ten-Year Average	Appraised Future Income Stream	Historic Five-Year Average	Historic Eight-Year Average	Historic Ten-Year Average
I	1	$40.75	$51.25	$39.12	$33.27	$43.68	$40.59	$31.75	$27.90
	2	34.28	45.33	34.36	29.03	40.44	37.88	29.61	26.01
II	3	10.74	51.45	36.17	29.53	22.58	32.67	24.31	20.91
	4	10.74	49.04	34.46	28.06	22.58	31.71	23.63	20.32
	5	11.74	51.87	37.08	30.45	26.99	32.68	24.53	21.14
	6	7.98	38.20	26.73	21.46	21.43	28.05	21.16	18.26
	7	14.92	36.53	25.37	20.21	24.21	26.55	19.85	17.04
	8	10.71	48.25	33.33	27.01	22.61	32.40	24.12	20.78
	9	6.77	38.64	27.05	21.74	20.95	28.22	21.29	18.37
	10	14.70	47.03	32.40	26.19	24.20	31.91	23.74	20.46
	11	15.94	46.73	32.16	25.98	24.70	31.79	23.65	20.37
	12	10.71	46.84	32.25	26.06	22.61	31.84	23.69	20.40
	13	7.98	34.01	23.39	18.50	21.43	26.37	19.82	17.08
	14	10.07	42.65	30.16	24.47	22.27	29.83	22.53	19.46
	15	12.92	43.50	29.67	23.81	23.49	30.50	22.66	19.50
	16	3.91	36.24	25.12	20.02	19.80	27.26	20.51	17.69
	17	12.92	42.44	28.86	23.09	23.49	30.08	22.33	19.22
	18	8.51	41.25	27.95	22.30	21.73	29.60	21.97	18.90
III	19	12.36	42.24	28.72	22.97	23.27	30.00	22.27	19.17
	20	6.31	39.37	26.96	21.43	20.85	29.09	21.57	18.55
	21	5.23	36.94	25.65	20.49	20.33	27.54	20.73	17.88
	22	10.07	38.95	27.24	21.89	22.27	28.35	21.36	18.44
	23	6.31	36.72	24.47	19.25	20.85	27.79	20.57	17.68
	24	3.91	38.41	26.81	21.51	15.82	23.10	17.35	14.95
	25	3.91	33.72	23.14	18.28	19.80	26.25	19.72	16.99
	26	1.82	35.36	14.42	19.40	15.12	22.08	16.56	14.25
	27	6.66	29.20	19.55	15.11	20.90	24.45	18.29	15.73

TABLE 5.15--Continued

General Capability	Parcel	Owner Operator Net Return/Acre				Landlord Net Return/Acre			
		Appraised Future Income Stream	Historic Five-Year Average	Historic Eight-Year Average	Historic Ten-Year Average	Appraised Future Income Stream	Historic Five-Year Average	Historic Eight-Year Average	Historic Ten-Year Average
III	28	$1.63	$29.92	$19.68	$15.14	$15.09	$20.40	$15.10	$12.95
	29	4.13	28.52	18.99	14.61	15.89	19.80	14.75	12.66
	30	1.16	34.22	23.50	18.59	14.90	21.70	16.25	13.98
	31	2.48	31.37	21.27	16.63	15.34	20.75	15.51	13.33
	32	1.16	28.86	19.31	14.91	14.90	19.92	14.86	12.76
	33	4.68	30.24	20.36	15.82	20.11	24.86	18.61	16.01
	34	2.37	35.54	24.73	19.72	19.19	26.98	20.36	17.57
	35	1.05	32.67	22.31	17.55	14.86	21.19	15.86	13.63
	36	3.14	34.89	24.11	19.14	19.49	26.72	20.11	17.34
	37	-3.20	26.17	16.77	12.59	13.48	19.15	14.14	12.10
	38	2.37	32.06	21.97	17.28	19.19	25.59	19.25	16.59
IV	39	-2.25	24.47	15.83	11.83	13.76	18.46	13.70	11.73
	40	-3.57	13.15	6.89	3.96	13.32	14.86	10.73	9.11
Average		$7.95	$37.61	$25.96	$20.73	$20.94	$26.97	$20.22	$17.43

TABLE 5.16

ESTIMATED NET RETURNS TO GRASSLAND EMPLOYING ALTERNATIVE PERIODS OF YEARS FOR AVERAGING GROSS RENTAL RATES AND MAINTENANCE COSTS

Production Potential Grouping	Parcel	Landlord's Net Return/Acre			
		Appraised Future Income Stream	Historic Five-Year Average	Historic Eight-Year Average	Historic Ten-Year Average
I	1	$6.55	$4.78	$4.24	$3.95
	2	5.20	3.83	3.38	3.15
	3	6.10	4.56	4.05	3.77
	4	5.20	3.83	3.38	3.15
	5	6.10	4.56	4.05	3.77
	6	6.10	4.56	4.05	3.77
	7	6.10	4.56	4.05	3.77
	8	6.55	4.78	4.24	3.95
	9	4.30	3.10	2.72	2.53
	10	6.10	4.56	4.05	3.77
II	11	6.55	4.92	4.38	4.08
	12	6.10	4.56	4.05	3.77
	13	6.55	4.92	4.38	4.08
	14	6.55	4.92	4.38	4.08
	15	7.00	5.29	4.71	4.39
	16	7.00	5.29	4.71	4.39
	17	5.20	3.69	3.25	3.02
	18	4.30	3.10	2.72	2.53
	19	6.10	4.56	4.05	3.77
	20	6.10	4.42	3.91	3.64
III	21	6.10	4.56	4.05	3.77
	22	5.20	3.69	3.25	3.02
	23	7.00	5.29	4.71	4.39
	24	5.20	3.83	3.38	3.15
	25	6.55	4.92	4.38	4.08
	26	6.55	4.78	4.24	3.95
	27	5.20	3.83	3.38	3.15
	28	6.10	4.56	4.05	3.77
	29	6.55	4.92	4.38	4.08
	30	6.55	4.92	4.38	4.08
IV	31	6.10	4.56	4.05	3.77
	32	6.55	4.78	4.24	3.95
	33	4.30	3.10	2.72	2.53
	34	6.10	4.56	4.05	3.77
	35	7.00	5.15	4.57	4.27
	36	7.00	5.15	4.57	4.27
	37	6.55	4.78	4.24	3.95
Average		$6.22	$4.49	$3.98	$3.71

previous high years, longer periods may result in higher net returns to dryland.

Cash rental rates for grassland in Kansas have been increasing gradually in recent years. Therefore, longer periods of years currently result in increasingly lower net returns (see Appendix III; Period of Years).

Comparatively, grassland net returns have been more stable than dryland net incomes or net crop shares. Two phenomena might be partially accountable for grassland dryland comparisons. First, if the net cash rental method of estimating net return is employed, typically less risk is assumed by the landlord compared to the landlord's risk assumed under the net crop share method. The difference in degree of ownership risk is even greater between the net rental method and the owner operator net income method.

Secondly, the level of grassland returns compared to dryland returns depends upon the time period selected. The period studied includes some of the best years on record for dryland returns. The period also includes relatively poorer years for cattle and other grassland enterprises. The relationship between cropland and grassland returns may reverse over the years. Therefore, so may use value appraisals employed for property tax purposes.

FOOTNOTES: Chapter V

1. Kansas Department of Agriculture, Farm Facts (1966-1975).

2. Department of Economics, K.S.U. Farm Management Guides.

3. Kansas Department of Revenue, Statistical Reports, (1975).

4. Allen J. Harris, Wilfred H. Pine, and Wilton B. Thomas, Kansas Farm Leasing Arrangements Summary of 1970 Survey, Cooperative Extension Service Bulletin MF-240 (Kansas State University, November 1972); Wilfred H. Pine and Joseph L. Kramer, Crop Share Leases in Kansas, Kansas Agricultural Experiment Station Bulletin 606 (March 1977); Larry N. Langemeier, Returns to Cropland and Capital Investment on Kansas Farms, Kansas Agricultural Experiment Station Bulletin 595 (February 1976).

5. Langemeier, Returns to Cropland, p. 2.

6. Department of Economics, Farm Management Summary and Analysis Report, Cooperative Extension Service, (Kansas State University, 1966-1975).

7. Department of Revenue, Statistical Report.

8. Department of Economics, KSU Farm Management Guides.

9. Department of Economics, "Farm Management Labor Standards for Kansas Associations," Cooperative Extension Service Farm Management Section (Kansas State University, 1976).

10. Langemeier, Returns to Cropland.

11. Kansas Department of Agriculture, Farm Facts, (1966-1975).

12. Kansas Department of Revenue, Statistical Reports, (1966-1975).

13. T. Roy Bogle, "Determining Net Return to Land," testimony presented to the Use Value Subcommittee, Kansas House of Representatives, February 8, 1977; Langemeier, Returns to Cropland.

14. Pine, Wilfred H. and Schlender, John R., Professional Farm Appraisal and Management Practices and Fees in Kansas, Cooperative Extension Service Bulletin MF-432 (Kansas State University, March 1977).

15. Leftwich, ch. 17, p. 327.

16. Kansas Department of Agriculture, Farm Facts.

17. Soil Conservation Service, Soil Survey of Cloud County.

18. R. H. Rust, and L. D. Hanson, Crop Equivalent Rating Guide for Soils of Minnesota, Agricultural Experiment Station MR-132 (University of Minnesota, 1975), p. 7.

19. Kansas Legislature, House Select Committee on Use Value, testimony given by Dickinson and McBee, Soil Conservation Service (February 15, 1977).

20. Soil Conservation Service, Soil Survey of Cloud County, p. 38, 74.

21. Pine, Cash Farm Rental Rates.

22. Kansas Department of Agriculture, Farm Facts.

23. Harris, Kansas Farm Leasing Arrangements; Pine, Crop Share Leases; Langemeier, Returns to Cropland.

24. Kansas Legislature, S.B. 484, 1977; H.B. 2631, 1977; H.B. 2732, 1978.

CHAPTER VI

MARKET OR USE VALUE

Alternative values were compared for each parcel: current (1976) valuation on the tax roll, appraised value as determined by the research appraiser employing fair market value, and use value. Use values employing various capitalization rates were included. Table 6.1 displays the alternative values for each parcel.

Methods

Current valuation was determined by adjusting assessed valuation listed on the county clerk's tax roll as of November 1, 1976 to one-hundred percent of value. Assessments on the tax roll are listed at thirty percent of appraised value.

Appraised market values were determined by the research appraiser for the parcels as of February 1977. These market values were the result of appraisals conducted employing methods described in Chapter IV.

Use values for cropland were estimated employing the owner operator net income method and landlord's net crop share method of estimating net return. The landlord's net cash rent method was employed for grassland. Appraisal leasing arrangements and crop mixes were employed along with eight year averages (1968-1975) of product prices, expenses, soil type adjusted yields and cash rental rates adjusted.

TABLE 6.1

CURRENT VALUATION, APPRAISED MARKET VALUE, AND USE VALUE ESTIMATED AT VARIOUS CAPITALIZATION RATES

Parcel	Current Valuation	Appraised Market Value	Use Value - Owner/Operator's Net Return Alternative Capitalization Rates			Use Value - Landlord's Net Return Alternative Capitalization Rates		
			8.5%	9.25%	10%	8.5%	9.25%	10%
Irrigated								
1	$38,367	$163,400	$118,569	$109,717	$102,193	$77,414	$71,900	$67,212
2	10,883	59,000	41,077	37,815	35,043	26,292	24,229	22,476
Dryland								
3	8,200	40,000	18,409	16,917	15,648	14,942	13,731	12,701
4	18,217	120,000	47,975	44,271	41,124	41,668	38,476	35,763
5	7,483	36,000	24,681	22,680	20,979	16,591	15,246	14,103
6	7,767	30,500	15,706	14,433	13,350	10,389	9,547	8,831
7	5,217	14,250	6,862	6,362	5,937	5,562	5,168	4,832
8	11,583	51,000	31,028	28,512	26,374	22,465	20,643	19,095
9	150	650	318	292	271	250	230	213
10	23,083	105,000	59,229	54,439	50,367	43,448	39,937	36,953
11	22,400	120,000	60,535	55,627	41,455	44,515	40,906	37,838
12	10,733	50,500	29,269	26,896	24,879	21,510	19,766	18,283
13	11,200	48,000	28,389	26,087	24,131	21,204	19,485	18,023
14	9,467	51,300	27,231	25,023	23,146	20,789	19,104	17,671
15	9,950	47,500	24,786	22,776	21,068	19,177	17,622	16,300
16	22,467	96,000	50,506	46,443	42,990	39,282	36,129	33,449
17	3,900	17,250	9,054	8,320	7,696	7,316	6,722	6,218
18	6,783	41,000	24,517	22,529	20,839	15,950	14,656	13,557
19	3,583	18,000	11,357	10,581	9,921	8,624	8,069	7,597
20	2,867	16,500	7,301	6,709	6,206	6,324	5,811	5,375
Mixed								
21	11,567	44,700	29,425	27,039	25,011	20,253	18,611	17,215
22	5,033	19,000	8,640	8,183	7,794	7,722	7,339	7,014
23	18,650	84,500	37,047	34,144	31,677	31,632	29,169	27,075
24	3,100	14,250	6,201	5,718	5,308	5,280	4,872	4,525
25	31,367	115,000	67,687	64,388	61,584	59,450	56,819	54,582

TABLE 6.1--Continued

Parcel	Current Valuation	Appraised Market Value	Use Value - Owner Operator's Net Return Alternative Capitalization Rates 8.5%	9.25%	10%	Use Value - Landlord's Net Return Alternative Capitalization Rates 8.5%	9.25%	10%
26	$18,567	$98,000	$45,089	$41,433	$38,325	$36,273	$33,332	$30,832
27	18,833	78,000	33,542	30,823	28,511	26,970	24,783	22,924
28	11,283	49,500	22,315	20,505	18,968	18,787	17,263	15,969
29	17,483	67,250	32,071	29,470	27,260	27,610	25,371	23,469
30	6,117	32,360	16,756	15,397	14,242	11,670	10,723	9,919
31	10,300	21,900	11,469	11,269	11,099	11,380	11,187	11,023
32	6,917	32,500	12,635	11,611	10,740	10,053	9,237	8,545
33	12,933	74,000	31,927	29,403	27,258	25,048	23,082	21,411
34	7,067	38,250	22,369	21,326	20,439	18,957	18,190	17,539
35	6,567	37,000	16,371	15,044	13,916	12,170	11,183	10,344
36	9,700	49,000	16,162	14,851	13,737	13,280	12,203	11,288
37	9,083	42,250	19,160	17,606	16,286	17,516	16,096	14,889
38	5,600	30,000	10,321	9,484	8,773	9,034	8,301	7,679
39	16,567	72,000	33,388	31,967	30,759	31,413	30,152	29,080
40	12,233	52,300	13,343	12,261	11,342	12,258	11,264	10,419
41	6,017	31,400	13,279	12,202	11,287	11,872	10,910	10,091
42	5,167	18,500	4,555	4,332	4,142	4,781	4,539	4,333
Grassland								
43	2,683	9,600				1,593	1,464	1,354
44	11,600	44,000				7,616	6,999	6,474
45	5,600	24,000				4,119	3,785	3,502
46	10,200	46,000				8,086	7,430	6,873
47	983	4,200				721	663	613
48	2,400	10,500				1,593	1,464	1,354
49	2,800	11,000				3,965	1,750	1,618
50	5,300	23,100				1,076	3,643	3,370
51	2,800	6,000					989	915

The interim legislative committee proposal prescribes a rate equal to the five-year average contract rate of interest on new federal land bank loans plus 0.75 percent. If this method would have been employed during 1977, the estimated capitalization rate would have been 9.25 percent (see Appendix I).

The purpose of this study is not to select a "proper" capitalization rate. That is a decision that must be decided via the political process. Proponents of use value select high rates and opponents select low rates. Therefore, three alternative capitalization rates are employed to estimate use value in this study: 8.5 percent, 9.25 percent and 10 percent.

Appraised market value attributed to improvements, timber, and wasteland were added to estimated use values. For study purposes, timber and wasteland were arbitrarily excluded from land devoted to agricultural use. Therefore market values and use values include identical values attributable to improvements, timber and wasteland.

Parcels in table 6.1 are grouped according to 1977 agricultural use as determined by the research appraiser. Groupings include irrigated, dryland, mixed dryland and grassland, and grassland parcels. Dryland and mixed parcels are ordered from tracts with the most capability class I soils to tracts with the most capability class IV soils. Grassland tracts are ordered according to range site production potential.

For comparison purposes, use value at the 9.25 percent capitalization rate was converted to percentages of current valuation and of appraised market value. Results are listed in tables 6.2 and 6.3.

TABLE 6.2

USE VALUE OF APPRAISAL PARCELS AT 9.25 PERCENT CAPITALIZATION AS A PERCENT OF CURRENT VALUATION AND AS A PERCENT OF APPRAISED MARKET VALUE

		Owner Operator Method		Landlord Method	
Current Agricultural Use	Parcel	Percent of Current Valuation	Percent of Appraised Value	Percent of Current Valuation	Percent of Appraised Valuation
Irrigated	1	286%	67%	187%	44%
Parcels	2	347	64	223	38
Dryland	3	206	42	167	34
Parcels	4	243	37	211	32
	5	303	63	204	42
	6	186	47	123	31
	7	122	45	99	36
	8	246	56	178	40
	9	194	45	153	35
	10	236	52	173	38
	11	248	46	183	34
	12	251	53	184	39
	13	233	54	174	41
	14	264	49	202	37
	15	229	48	177	37
	16	207	48	161	38
	17	213	48	172	39
	18	332	55	216	36
	19	295	59	225	44
	20	234	41	203	35
Mixed Dry	21	234	60	161	42
Cropland and	22	163	43	146	39
Grassland	23	183	40	156	35
	24	184	40	157	34
	25	205	56	181	49
	26	223	42	179	34
	27	164	40	132	32
	28	181	41	153	35
	29	169	44	145	38
	30	252	48	175	33
	31	109	51	108	51
	32	168	36	134	28
	33	227	40	178	31
	34	302	56	257	48
	35	229	41	170	30
	36	153	30	226	25
	37	194	42	177	38
	38	169	32	148	28
	39	193	44	182	42
	40	100	23	92	22
	41	203	39	181	35
	42	84	23	88	25

TABLE 6.2--Continued

Current Agricultural Use	Parcel	Owner Operator Method: Percent of Current Valuation	Owner Operator Method: Percent of Appraised Value	Landlord Method: Percent of Current Valuation	Landlord Method: Percent of Appraised Valuation
Grassland	43	-%	-%	55%	15%
	44	-	-	60	16
	45	-	-	68	16
	46	-	-	73	16
	47	-	-	67	16
	48	-	-	61	14
	49	-	-	63	16
	50	-	-	69	15
	51	-	-	35	16

TABLE 6.3

MEAN PERCENTAGES OF USE VALUES AT 9.25 PERCENT CAPITALIZATION AS A PERCENT OF CURRENT VALUATION AND AS A PERCENT OF APPRAISED VALUE

Current Agricultural Use	Owner Operator Method: Percent of Current Valuation	Owner Operator Method: Percent of Appraised Value	Landlord Method: Percent of Current Valuation	Landlord Method: Percent of Appraised Value
Irrigated Parcels	317%	66%	205%	41%
Dryland Parcels	236	49	178	37
Mixed Dryland Grassland Parcels	186	41	156	35
Grassland Parcels	61	16	61	16

Results of Comparisons

Based on appraisals conducted in February 1977, grassland use values employing the study procedures and the 9.25 percent capitalization rate are 16 percent of appraised market value. Dryland use values employing the study procedures and the owner operator net income method range from 37 to 63 percent of appraised market value with a mean of 49 percent. Dryland use values employing 9.25 percent capitalization and the landlord's net crop share method range from 32 to 44 percent of appraised market value with a mean of 37 percent. Differences between irrigation use values and irrigation appraised market values are not significantly different from dryland differences. Irrigated use values are 41 and 66 percent of appraised market value employing the landlord and owner operator methods respectively (see Appendix III; Market or Use Value).

From the results it was concluded that use value is significantly lower than appraised market value employing the study procedures. It was also concluded that grassland use values are relatively lower compared to grassland appraised market value than was irrigated or dryland use values compared to appraised market value of cropland. This is attributed to the relative levels of historical net returns and assumed risks employed in methods used.

Comparing use value to current valuation indicates different results. Current valuations are relatively higher than use values for grassland employing the study procedures. Current valuations are relatively lower than use values for dryland. Irrigation mean percentages of current valuations are significantly higher than those

for dryland. Based on percentages, irrigation and dryland use values are relatively greater compared to current irrigation valuations than are grassland parcels (see Appendix III; Market or Use Value).

Is the relationship between use value and market value consistent for more capable dryland tracts compared to less capable dryland tracts and for grassland with more production potential compared to grassland with relatively less production potential? Spearman's correlation coefficients were estimated to determine an answer.

The dryland correlation coefficients range from .2514 to .3405 depending on the particular use value/market value percentage employed. In any case, the correlation coefficients are not significantly different from zero at a ten percent level of significance. Therefore, no evidence is present that indicates different use value/market value percentages for more capable dryland tracts over less capable dryland tracts. Variation of percentages are basically random within dryland agricultural use groupings.

Grassland correlation coefficients are .0333 and -.0298 and are not significantly different from zero at the ten percent level of significance. Therefore, the evidence did not indicate different use value/market value percentages for grassland with more production potential compared to grassland with less production potential. Variation of percentages are basically random within grassland use groupings.

Similar to results of previous study,[1] Cloud County research indicates that use value increases valuations for irrigated and dryland but not as much as reappraisal under market value. Grassland variations actually decrease if use value is employed but reappraisal under market value increases grassland valuations for property tax purposes.

The results are expected when recognized that Cloud County, like most other counties in Kansas, has not been reappraised since 1967.[2] Market values of Kansas agricultural land have more than doubled since then. New valuation has been added to the tax roll and debased to the last year of reappraisal.[3] Therefore, valuation on the tax roll was approximately ten years out of date at the time of the study. It was determined that fair market values on the tax roll for the appraisal parcels were 23 percent of appraised market values as of February 1977. The value comparisons are therefore realistically understandable.

FOOTNOTES: Chapter VI

1. Flinchbaugh, Yes or No, p. 13.

2. Kansas Department of Revenue, Sales Ratio Study.

3. Kansas Legislature, Special Committee on Use Value Appraisal, Minutes, July 11-12, 1977.

CHAPTER VII

ASSESSMENT RATIO COMPARISONS

Assessment sales ratios have been employed to monitor relative levels of assessment (see Appendix I). An alternative used by other states, including Maryland and California, is the use of appraisals in place of sales. Costs of appraisals may or may not be prohibitive. But aside from costs, are there differences between assessment sales ratios and assessment market value appraisal ratios? An earlier Kansas study indicated median assessment sales ratios approximate median assessment appraisals ratios.[1] However, does uniformity differ by employing alternative assessment ratio methods? Appraisals conducted in Cloud County provided a data base for comparison of the alternative ratio methods.

Sales or Appraisals

Cloud County assessment sales ratios were compared to assessment market value appraisal ratios for the randomly selected parcels of agricultural investment land. Results are listed in table 7.1.

Assessment sales ratios for the county are actual assessments compared to actual sale prices for agricultural investment property which sold during September 1976 through August 1977.[2] Abnormal sales were screened prior to determining ratios by the Division of Property Valuation, Kansas Department of Revenue.

Assessment market value appraisal ratios are actual assessments compared to appraised market value as of February 1977 for the randomly selected sample of agricultural investment parcels. To prevent bias, the research appraiser did not have access to assessments during the appraisal

TABLE 7.1

COMPARISON OF ALTERNATIVE ASSESSMENT RATIOS FOR AGRICULTURAL INVESTMENT PROPERTY

Assessment/Sales Ratios Sept. 76 - Aug. 77 Sales (30 Sales)		Assessment/Appraisal Ratios Market Value Feb. 1977 (51 Appraisals)		
55	7	14.1	7.0	6.2
31	6	14.0	7.0	6.1
21	6	11.0	6.9	6.0
20	6	8.4	6.9	5.9
18	6	8.4	6.9	5.7
18	6	8.2	6.9	5.7
16	6	7.9	6.8	5.7
14	6	7.9	6.8	5.6
11	6	7.8	6.8	5.6
10	6	7.8	6.7	5.5
8	6	7.6	6.6	5.5
8	5	7.6	6.6	5.3
8	3	7.2	6.5	5.3
8		7.0	6.4	5.2
8		7.0	6.4	5.2
7		7.0	6.4	5.0
7		7.0	6.3	4.6
Range	52.0		9.5	
Median	8.0		6.8	
Coeff. Dev.	69		16	
Mean	11.4		6.9	
Coeff. Dev.	59		16	

process. Market value appraisals were conducted as previously discussed in Chapter IV.

Results of Comparisons

The results indicate that median levels of assessment are similar for both ratio samples. The median assessment sales ratio indicates that agricultural investment parcels were assessed at 8 percent of sale price. The median assessment appraisal ratio indicates that agricultural investment parcels were assessed at 6.8 percent of appraised market value. The difference was not significant at a ten percent level. Therefore in Cloud County, median assessment sales ratios approximate median assessment appraisal ratios for agricultural investment parcels.

Coefficients of deviation are designed to measure variation. According to Kansas law when a coefficient of deviation for any class or sub-class or property in a county exceeds 20, the Director of Property Valuation is directed to order the property reappraised, commencing after December 31, 1978 (see Appendix I). Therefore, determining coefficients of deviation is not just an academic exercise.

Table 7.1 results indicate that coefficients of deviation are significantly greater for the assessment sales ratios compared to the assessment appraisal ratios at a ten percent level of significance. For the sales ratios the average deviation is 69 percent away from the median. For the appraisal ratios the average deviation is 16 percent away from the median. Therefore, Cloud county agricultural investment land assessment ratios based on sales exhibit more variation than do assessment appraisal ratios.

Assessment Use Value Ratios

If use value appraisal was implemented for tax purposes, there would be relatively less logic in continuing to compare assessments to sales for the purpose of monitoring agricultural land assessments. Assessment appraisal ratios might be used to monitor assessments if appraisals were based on the aforementioned definition of use value.[3]

For purposes of studying an alternative ratio for use value, thirty percent assessments employing methodology and procedures similar to the legislative interim committee proposal were compared to use values employing a set of basic commercial appraisal assumptions.[4] Results are listed in table 7.2.

TABLE 7.2

ASSESSMENT USE VALUE RATIOS AND RESPECTIVE NET RETURNS

Parcel Number	Assessment Appraisal Ratios	"Assessed" Net Returns/Acre			"Appraised" Net Returns/Acre		
		Irrigated	Dry	Grass	Irrigated	Dry	Grass
1	40.3	-	21.90	4.06	-	16.23	3.91
2	39.9	-	20.96	4.06	-	15.66	3.25
3	37.1	-	20.09	4.06	-	15.44	2.72
4	36.7	-	19.65	4.06	-	15.83	4.05
5	36.0	-	-	4.06	-	-	3.38
6	36.0	-	-	4.06	-	-	3.38
7	35.8	-	17.40	4.06	-	14.59	3.25
8	35.4	-	24.70	-	-	20.93	-
9	35.0	-	18.73	4.06	-	15.70	4.05
10	34.7	-	24.17	4.06	-	20.93	3.38
11	34.5	-	18.66	4.06	-	15.49	4.05
12	34.0	-	18.60	4.06	-	16.34	4.24
13	33.7	-	20.58	4.06	-	15.49	4.05
14	32.7	-	14.17	4.06	-	14.25	3.38
15	32.4	-	24.10	4.06	-	22.31	4.24
16	32.3	-	25.87	-	-	24.03	-
17	32.0	-	17.53	4.06	-	14.40	4.38
18	31.8	-	23.66	4.06	-	22.31	4.57
19	31.8	-	23.16	-	-	21.81	-
20	31.7	-	21.38	-	-	20.25	-
21	31.7	-	22.04	-	-	20.79	-
22	31.4	59.57	-	-	56.96	-	-
23	31.0	-	21.03	4.06	-	19.84	4.38
24	30.9	-	21.50	4.06	-	20.86	4.05
25	30.9	-	20.47	4.06	-	19.84	4.05
26	30.9	-	18.80	4.06	-	20.72	2.72
27	30.7	-	20.10	4.06	-	19.30	4.38
28	30.6	-	20.85	4.06	-	19.57	4.05
29	30.5	-	21.84	4.06	-	21.13	4.05
30	30.4	-	21.13	4.06	-	19.30	4.71
31	30.3	-	22.03	4.06	-	21.81	4.05
32	30.2	59.48	-	-	59.07	-	-
33	30.1	-	-	4.06	-	-	4.05
34	30.1	-	-	4.06	-	-	4.05
35	30 1	-	21.94	4.06	-	21.58	4.71
36	29.9	-	23.52	-	-	23.62	-
37	29.5	-	20.50	4.06	-	20.86	4.24
38	29.4	-	22.59	-	-	23.03	-
39	29.4	-	23.52	-	-	24.01	-
40	29.2	-	22.23	4.06	-	22.81	4.24
41	29.0	-	22.26	-	-	23.03	-
42	29.0	-	20.37	4.06	-	21.13	4.24
43	28.7	-	19.26	-	-	20.11	-

TABLE 7.2--Continued

Parcel Number	Assessment Appraisal Ratios	"Assessed" Net Returns/Acre			"Appraised" Net Returns/Acre		
		Irrigated	Dry	Grass	Irrigated	Dry	Grass
44	28.6	-	20.54	4.06	-	22.13	2.72
45	27.9	-	-	4.06	-	-	4.38
46	27.9	-	-	4.06	-	-	4.38
47	27.9	-	-	4.06	-	-	4.38
48	26.7	-	-	4.06	-	-	4.57
49	25.9	-	-	4.06	-	-	4.71
50	22.0	-	22.17	-	-	30.87	4.71
51	21.5	-	23.61	-	-	32.95	-
Range	18.8	-	11.70	0	-	18.70	1.99
Median	30.9	-	20.54	4.06	-	19.84	4.05
Coeff. Dev.	8	-	9	0	-	15	10
Mean	30.8	59.52	21.19	4.06	58.01	20.28	3.98

Net returns per acre used to estimate assessments are based on (1) county average crop mix, (2) soil type predicted yields adjusted by county average yields 1968-1975, (3) constant leasing arrangements, and (4) 1968-1975 historical eight-year averages of product prices and crop costs. Grassland net returns are based on 1968-1975 historical averages of rental rates, maintenance costs, and property taxes. Net returns are capitalized at the rate of 9.25 percent. The method is similar to an interim legislative committee proposal for estimating net returns (see Appendix I).

Net returns per acre used to estimate appraisals for cropland are based on (1) appraisal crop mix, (2) appraisal yields by predominant soil type, (3) appraisal leasing arrangements, and (4) 1968-1975 historical averages of product prices and crop costs. Grassland net

returns are based on appraisal rental rates adjusted by 1968-1975 historical averages of rental rates, maintenance costs and property taxes. Net returns are capitalized at the rate of 9.25 percent. This method is similar to an eight-year average return to land as would have been estimated using commercial appraisal assumptions.

Results of Comparisons

As expected, the median assessment use value appraisal ratio is not significantly different from the statutory thirty percent assessment rate at a ten percent level of significance.[5] The study proposal results in use values at a level similar to use values estimated employing commercial appraisal assumptions for determining net returns.

Variation in assessment appraisal ratios based on the two methods is a result of differences between net returns employing the alternative procedural assumptions. Net returns are more dispersed under the commercial appraisal assumptions. Extremes in net returns are underestimated employing the proposal of the interim legislative committee.

The basic purpose on presenting the use value ratio results is to demonstrate an alternative method of monitoring levels of assessment if use value is implemented. In considering the results, it must be recognized that only one subclass of property in one county has been studied and the assumptions have been based on proposals only. If use value ratios are to be employed, the results of such ratios may be quite different. In Cloud County, comparisons are between appraisals based on a proposal and appraisals determined

by an appraiser. If use value ratios are actually employed, the 30 percent assessments determined by a county appraiser might be compared to appraisals conducted by a Property Valuation Division, Kansas Department of Revenue and some disinterested third party.

FOOTNOTES: Chapter VII

1. Foster, "An Evaluation of Sales Ratio Studies," 1967.

2. Kansas Department of Revenue, Sales Ratio Study, 1977.

3. Kansas Legislature, H.B. 2732, 1978.

4. Commercial appraisal assumptions refer to the assumptions employed by a fee appraiser and related to estimation of net returns to agricultural land investment.

5. K.S.A. 1439.

CHAPTER VIII

SUMMARY OF CONCLUSIONS

Based on review of literature and the methods employed in Cloud County, various conclusions have been drawn concerning (1) the impact of various factors, information sources, and methods used for estimating net returns on use value appraisal, (2) differences between market value and use value appraisal and (3) alternative assessment ratios employed to monitor relative levels of assessment. These conclusions are renumerated as follows.

Factor Conclusions

1. Method - Except for the least capable tracts, dryland net returns estimated employing the owner operator net income method were consistently higher than net returns employing the landlord's net crop share for the time period studied.

2. Yields - Compared to other sources of yield information, Cloud County average yields result in under-estimated net returns for the more capable land and over-estimated net returns for the relatively less capable land. Appraisal yields accounted for individual parcel characteristics and limitations not present in yield guidelines by soil type or county average yields. Predicted yields as published in the soil survey result in over-estimated and under-estimated net returns compared to historical yields.

Generally, dryland tracts with a higher capability class tend to have higher net returns and those with a lower capability class tend to have lower net returns. However, various class I soils may yield lower net returns than other class II, III, and IV soils and various class IV soils may yield higher net returns than other class I, II, and III soils, based on capability.

3. Rental Rates - Grassland tracts with more production potential based on range site classification do not necessarily merit higher rental values. County average rental rates approximate the appraisal rental rates over all range sites.

4. Crop Mix - Dryland net returns based on county average crop mix tend to be lower than net returns employing the appraisal crop mix when the appraisal crop mix favors relatively more wheat. Dryland net returns based on county average crop mix tend to be higher than net returns based on appraisal crop mix when the appraisal crop mix favors grain sorghum. Extreme differences in net returns were random over the capability classes employed. Therefore, the county average crop mix was an approximate measure of the actual crop mix over all capability classes for the time period studied.

5. Leasing Arrangements - Compared to appraisal leases, employing a constant leasing arrangement under-estimates dryland net returns on the more capable tracts and over-estimates net returns on the less capable tracts.

6. Period of Years - Longer periods of historical data currently result in lower dryland net returns. However, if future income streams are relatively low compared to previous high years, longer periods would result in higher net return to dryland investment.

Longer periods of historical data currently result in lower grassland net rental estimates. Shorter periods of years reflect gradually increasing grassland net rentals. However, over the longer run the relationship among various periods of years may change.

Use and Market Value Conclusions

1. Use value appraisal for tax purposes increases valuations of irrigated and dryland for the time period studied. The extent depends on the capitalization rate utilized and the methods employed to estimate net returns. The increase is less under use value than under reappraisal employing current fair market value statutes.

2. Use value appraisal for tax purposes decreases valuation of grassland for the time period studied. The extent depends upon the capitalization rate utilized and the methods employed to estimate net returns. Reappraisal of grassland under current statutes increases valuations in Cloud County.

3. The effects of implementing use value appraisal do not vary by dryland capability or grassland production potential classes. Use value would increase valuations for the more capable dryland tracts proportionately to valuations of less capable dryland tracts and likewise for grassland.

Assessment Ratio Conclusions

1. Median assessment sales ratios are similar to median assessment appraisal market value ratios for agricultural investment land.

2. Assessment sales ratios exhibit more variation than does assessment market value appraisal ratios for agricultural investment land in Cloud county.

3. Median assessment appraisal use value ratios approximate the 30 percent assessment rate under the procedures employed. The study proposal results in use values at a level similar to use value estimated under commercial appraisal assumptions for determining net returns. However, net returns are more dispersed under the commercial appraisal assumptions. Extremes in net returns can be underestimated using the interim legislative committee's study proposal.

Concluding Statement

Appraisals for tax purposes could be increased and the tax rate could be decreased to collect the same amount of taxes. Little shift would occur if all property was assessed at a uniform level. The root of current circumstances is that all property is not assessed uniformly.

Criteria employed in valuing property for tax purposes may vary by property type and appraiser. If this is the case, then only appraisals within each type of property may be uniform to the respective criteria employed. Levels of assessment among various property types and various criteria become political decisions and are hammered out in the political arena. Should agricultural land be valued for property tax purposes by employing a different method of appraisal? In the final analysis, the decision will be political.

Market value appraisals for tax purposes in Kansas are conducted by 105 county appraisers. The system for valuing property is relatively

dispersed. Valuation is currently determined by each appraiser. The current system allows for on-the-spot appraisal and valuation of individual parcels with respect to their unique characteristics. It allows 105 interpretations of the valuation statutes.

The proposed use value system is less dispersed in decision-making authority. Yearly, valuation schedules would be developed by the Division of Property Valuation with the assistance of county appraisers. The schedules would be issued to each county appraiser. A value would be listed for each class of agricultural land according to S.C.S. capability classes. All acres in the same class of a county or homogeneous region would be assigned the listed value. Classification decisions of agriculture land would be the responsibility of the county appraiser.[1]

A decrease in the county appraiser's authority to interpret valuation statutes and develop his own criteria for valuation can result in less variation among appraisals or more uniformity in appraisals, particularly across county lines. It can also result in under estimation of extremes in values, thus penalizing the owners of the less productive land and rewarding the owners of the more productive tracts.

One final thought for consideration. Assessment sales ratios are employed by law as a measuring stick of the level of assessment. Ratios are a means of "grading" the appraiser.[2] In the actual land market, buyers and sellers of land employ various criteria for determining the land price willingly paid or received. Sales may accurately estimate average market value, but their use as a measure of uniformity might be questioned. Assessments can be relatively uniform to one appraisal criteria, while assessment sales ratios exhibit wide variation.

FOOTNOTES: Chapter VIII

1. Kansas Legislature, H.B. 2732, 1978.

2. K.S.A. 1436b.

APPENDIX I. LEGISLATIVE CONSIDERATIONS

The Constitutional Amendment

The amendment, adopted at the general election on November 2, 1976, added the following new section to Article 11 of the state constitution.

§
§ 12. Land devoted to agricultural use may be defined by law and valued for ad valorem tax purposes upon the basis of its agricultural income or agricultural productivity, actual or potential, and when so valued such land shall be assessed at the same percent of value and taxed at the same rate as real property subject to the provisions of section 1 of this article. The legislature may, if land devoted to agricultural use changes from such use, provide for the recoupment of a part or all of the difference between the amount of the ad valorem taxes levied upon such land during a part or all of the period in which it was valued in accordance with the provisions of this section and the amount of ad valorem taxes which would have been levied upon such land during such period had it not been in agricultural use and had it been valued, assessed and taxed in accordance with section 1 of this article.

USE VALUE APPRAISAL

House Bill No. 2732

By Special Committee on Use Value Assessment

Re: Proposal No. 1

AN ACT relating to taxation; concerning the valuation, assessment and taxation of land devoted to agricultural use; amending K.S.A. 79-501, 79-1412s, 79-1435, 79-1436a, 79-1437, 79-1439, 79-1609 and 79-2005 and K.S.A. 1977 Supp. 72-7040 and repealing the existing sections.

Be it enacted by the Legislature of the State Of Kansas:

New Section 1. From and after January 1, 1981, land devoted to agricultural use, as the same is defined by section 2 of this act, shall be valued for ad valorem tax purposes upon the basis of its agricultural income or agricultural productivity as authorized by section 12 of article 11 of the constitution of the state of Kansas, and shall be assessed at the same percent of value and taxed at the same rate as other real property subject to taxation under the laws of the state of Kansas.

New Section 2. (a) As used in this act, the phrase "land devoted to agricultural use" shall mean and include land, regardless of whether it is located in the unincorporated area of the county or within the corporate limits of a city, which is devoted to the production of plants, animals or horticultural products, including but not limited to: forages; grains and feed crops; dairy animals and dairy products; poultry and poultry products; beef cattle, sheep, swine and horses; bees and apiary products; trees and forest products; fruits, nuts and berries; vegetables; nursery, floral, ornamental and greenhouse products. Land devoted to agricultural use shall not include those lands which are used for recreational purposes, suburban residential acreages, rural home sites or farm home sites and yard plots whose primary function is for residential or recreational purposes even though said properties may produce or maintain some of those plants or animals listed in the foregoing definition.

(b) As used in this act, the term "expenses" shall mean those expenses typically incurred in producing the plants, animals and horticultural products described in subsection (a) including management fees, production costs, maintenance and depreciation of fences, irrigation wells, irrigation laterals and real estate taxes, but the term shall not include those expenses incurred in providing temporary or permanent buildings used in the production of said plants, animals and horticultural products.

New Section 3. (a) As of January 1, 1981, and as of January 1 of each year thereafter, land devoted to agricultural use shall be valued

for ad valorem tax purposes upon the basis of the agricultural income or agricultural productivity attributable to the inherent capabilities of said land in its current usage under a degree of management reflecting median production levels.

(b) A classification system for all land devoted to agricultural use shall be adopted by the director of property valuation using criteria established by the United States Department of Agriculture Soil Conservation Service. The classification of all land devoted to agricultural use within each county shall be delineated on aerial photographs in a manner prescribed by the director of property valuation.

(c) Productivity of land devoted to agricultural use shall be determined for all land classes within each county or homogeneous region based on an average of the eight (8) calendar years immediately preceding the calendar year which immediately precedes the year of valuation, at a degree of management reflecting median production levels. The director of property valuation shall determine median production levels based on information available from state and federal crop and livestock reporting services, the soil conservation service, and any other sources of data that the director considers appropriate.

(d) The share of net income from land in the various land classes within each county or homogeneous region which is normally received by the landlord shall be used as the basis for determining agricultural income for all land devoted to agricultural use except pasture or rangeland. The net income normally received by the landlord from such land shall be determined by deducting expenses normally incurred by the landlord from the share of the gross income normally received by the landlord. The net rental income normally received by the landlord from pasture or rangeland within each county or homogeneous region shall be used as the basis for determining agricultural income from such land. The net rental income from pasture and rangeland which is normally received by the landlord shall be determined by deducting expenses normally incurred from the gross income normally received by the landlord. Commodity prices and pasture and rangeland rental rates and expenses shall be based on an average of the eight (8) calendar years immediately preceding the calendar year which immediately precedes the year of valuation.

(e) Net income for every land class within each county or homogeneous region shall be capitalized at a rate determined to be the sum of the contract rate of interest on new federal land bank loans in Kansas on July 1 of each year averaged over a five-year period, which includes the five (5) years immediately preceding the calendar year which immediately precedes the year of valuation, plus seventy-five hundredths of one percent (.75%).

(f) Based on the foregoing procedures the director of property valuation shall make an annual determination of the value of land within each of the various classes of land devoted to agricultural use within each county or homogeneous region and furnish the same to the several

county appraisers who shall classify such land according to its current usage and apply the value applicable to such class of land according to the valuation schedules prepared and adopted by the director of property valuation under the provisions of this section.

(g) Any taxpayer aggrieved by the valuation schedule adopted by the director of property valuation under the provisions of this section may seek review of the same by appealing to the board of tax appeals by filing a written application, on a form approved by said board and furnished by the county appraiser, stating the grounds therefor. Appeals to the state board of tax appeals shall be filed with the board not later than the tenth day of April in the year in which the valuation schedule is adopted and applied. The director of property valuation shall be a party to any such appeal. The board of tax appeals shall fix a time and place for a hearing on such application and shall notify such taxpayer and the director of property valuation of the time and place so fixed. The time fixed for such hearing shall be not later than thirty (30) days after the filing of the application. At the time and place fixed for the hearing, the board shall hear such application and, when it determines such appeal, shall enter its order thereon and give notice of the same to the taxpayer and director of property valuation by mailing to each a copy of its order. Such order shall be made within sixty (60) days after the completion of said hearing. Any appeal from an order of the board of tax appeals issued hereunder shall be made in the manner provided by law.

New Section 4. (a) Whenever land, which has been valued and assessed under the provisions of this act, is devoted to a use other than agriculture, there shall be a recoupment of ad valorem taxes which were not levied upon such land by reason of the valuation and assessment thereof under the provisions of this act in the amount and manner hereinafter provided. Land which has been valued and assessed under the provisions of this act shall be appraised as the first day of January next following a change in use of such land to a use other than agriculture. Ad valorem taxes in the amount of the difference between the amount of taxes actually levied upon such land during the six (6) years, or during each of the years if less than six (6) next preceding such appraisal in which such land was valued in accordance with the provisions of this act, and the amount of taxes which would have been levied upon such land during such period had it been valued upon the basis of its fair market value in money, as defined and as determined pursuant to the provisions of K.S.A. 79-503 as other real property subject to taxation under the laws of the state of Kansas, shall be determined as of such date and shall become due on the first day of November next following. Such taxes shall be payable as provided by K.S.A. 79-2004 for the payment of other real estate taxes. A lien for such taxes shall attach to the land subject to the same on the first day of November in the year such taxes become due and all such taxes remaining due and unpaid after the date prescribed for the payment thereof shall be collected in the manner provided by law for the collection of delinquent taxes. Moneys collected from the recoupment tax hereunder shall be credited by the county treasurer to the several taxing subdivisions within which said land is located in the proportion that the total tangible property tax levies

made in the preceding year for each such taxing subdivision bear to the total of all such levies made in that year by all such taxing subdivisions. Such moneys shall be credited to the general fund of the taxing subdivision or if such taxing subdivision is making no property tax levy for the support of a general fund such moneys may be credited to any other tangible property tax fund of general application of such subdivision.

(b) Whenever the use of any land which has been valued and assessed under this act is changed to a use other than agricultural, the owner thereof shall give written notice of such change to the county appraiser within sixty (60) days after such change in use. Failure to give such notice within the time prescribed shall subject the owner of said land to a penalty equal to ten percent (10%) of the recoupment tax herein provided.

(c) For the purposes of this section, a change of use of land which has been valued and assessed under this act shall be deemed to occur upon the recording of a plat of said land or when the use of said of land ceases to be devoted to agricultural use as defined in section 2. If a plat is recorded for only a part of a tract of land, the recoupment tax provided for herein shall be determined for only that part of said tract which is platted and no longer qualifies as land devoted to agricultural use.

(d) Whenever the use of land is changed from an agricultural use to another use as a result of an exercise by the state of Kansas or any political or taxing subdivision thereof of the power of eminent domain or the threat or imminence thereof, no recoupment tax shall be levied and collected upon such land under the provisions of this section.

(e) In the year 1981, and in each year thereafter, the county treasurer shall each year include a notice with the tax statement for all land valued and assessed under the provisions of this act, which shall inform the taxpayer that such land has been valued under the provisions of this act and that a recoupment of additional ad valorem taxes shall be made if the use of such land is changed to a use other than agricultural. Such notice also shall inform the taxpayer of the duty to report any such change in use and of the penalty prescribed for failure to make such report.

New Section 5. The provisions of this act shall govern the valuation, assessment and taxation of land devoted to agricultural use but such land shall be subject to all general laws of the state relating to the assessment, levy and collection of taxes upon real property insofar as the same are not in conflict with the provisions of this act.

New Section 6. The secretary or revenue shall adopt such administrative rules and regulations as may be necessary to administer the provisions of sections 1 through 4 of this act.

Summary of Remaining Sections:*

Section 7 amends K.S.A. 79-501 to exclude land devoted to agricultural use from the requirement of appraisal at fair market value.

Section 8 adds to the section (K.S.A. 1976 Supp. 79-1412a) listing the duties of county appraisers that of reviewing grievances with taxpayers and making any necessary corrections in the assessment roll.

Section 9 conforms to the constitutional amendment by amending K.S.A. 79-1439 to make the 30 percent assessment standard applicable both to property appraised at market value as prescribed in K.S.A. 79-501 and to property appraised at its use value under this act.

Section 10 makes the Director a party to appeals by others in cases other than equalization alone, and authorized the Director of Property Valuation to appeal orders of the county board to the State Board of Tax Appeals.

Section 11 makes the Director of Property Valuation a party to any tax protest action involving the taxation of lands in agricultural use.

Section 12 amends K.S.A. 1977 Supp. 72-7040 to treat land valued at its agricultural use the same as personal property and state assessed property (i.e., no adjustment) in determining district wealth for school finance purposes.

Sections 13-15 amend the assessment-sales ratio study to eliminate from its coverage lands in agricultural use appraised for taxation at their use value (and improvements thereon).

Section 16 is the repealer section.

Section 17 makes the act effective on publication in the statute book.

*
Source: Special Committee on Use Value Appraisal, Committee Report, 1977 INTERIM, Sixty-Seventh Legislature, State of Kansas.

Rules for Valuing Property
Kansas Statutes Annotated 79-503

"Fair market value in money shall mean the amount of money that a well informed buyer is justified in paying and a well informed seller is justified in accepting, assuming that the parties thereto are acting without undue compulsion and that the property has been offered at the market place for a reasonable length of time. Sales in and of themselves shall not be the sole criteria of fair market value but shall be used in connection with cost, income and such other factors as may be appropriate including but not by way of exclusion:

(a) The proper classification of lands and improvements;
(b) the size thereof;
(c) the effect of location on value;
(d) depreciation, including physical deterioration or functional, economic or social obsolescence;
(e) cost of reproduction or improvements;
(f) productivity;
(g) earning capacity as indicated by lease price or by capitalization of net income;
(h) rental or reasonable rental values;
(i) sale value on open market with due allowance to abnormal inflationary factors influencing such values; and
(j) comparison with values of other property of known or recognized value. The ratio study shall not be used as an appraisal for appraisal purposes.

In each county of the state the county assessing officer shall on January 1, 1971, and on January 1 of each year thereafter classify and subclassify all real estate into the following classes:

A. Urban Property
   1. Residential. Residential property shall include land and improvements thereon used or if unoccupied designed for use as a single family dwelling or home.
   2. Multifamily. Multifamily property shall include land and improvements thereon containing independent dwelling units for two or more families in a single structure.
   3. Commercial. Commercial property shall include land and improvements thereon concerned with all activities of business or trade engaged in for the purpose of producing income but shall not include industrial property.
   4. Industrial. Industrial property shall include land and improvements thereon used for the conversion of materials into finished manufactured products fr for the purpose of warehouses or minor processing plants.
   5. Vacant lots. Vacant lots shall include unimproved property which has been platted into lots and blocks.

B. Rural property
   1. Agricultural investment. Agricultural investment shall include those properties presently used and operated as units with a source of economic life from the production of agricultural products that originate from land productivity.

2. Agricultural noninvestment. Agricultural noninvestment shall include those properties presently used and operated as non-economic agricultural units upon which some agricultural goods are produced but the primary source of value of which is as a rural home with cash needs derived from other than nonagricultural sources.
3. Home sites. Home sites shall include those properties that provide residential uses only with rural atmosphere that permits the use of horses, pets, etc. but do not produce goods or income from agricultural products.
4. Planned subdivisions. Planned subdivisions shall include those properties planned and platted for community residential uses, developed and sold as a commodity through wide mass sales exposures.
5. Spot industrial and commercial. Spot industrial and commercial properties shall include land and rural areas developed for spot industrial and commercial uses at selected locations to satisfy isolation or decentralized needs of industrial plants.
6. Recreational. Recreational properties shall include properties located in rural areas where lakes, streams, forest and mountain terrain and physical characteristics permit recreational uses of the commercial nature so that the source of economic life are from commercial improvements and not based on land capabilities and associated productivity responses.

The appraiser or assessor in arriving at fair market value in money may use different factors in determining the classifications best suited to arrive at fair market value in money as defined in this section. The director of property valuation shall as soon as possible prescribe forms for the county assessing officer of each county to assist them in making such classification and subclassification or property and to properly arrive at the fair market value in money of the property. To achieve greater uniformity in the appraisal of all real property the director of property valuation is authorized and directed to meet with county assessors, appraisers, and interested property owners in area meetings embracing as many counties as the director deems advisable for the purpose of developing regional guidelines to be used in the appraisal of all classes of real property."

Assessment Sales Ratios
Kansas Statutes Annotated 79-1437

"Upon securing information of real estate sales from the counties, the director shall determine, as nearly as possible, the sale price of each tract or piece of real estate and the ratio of the assessed valuation of the sale price. Beginning in September, 1974, and each year thereafter, the director shall determine the average ratio of all sales of urban real estate and rural real estate and for each classification of property and for all classes combined in each county for the twelve-month period ending on the thirty-first day of August of such year. The director shall quarterly notify the board of county commissioners of each county of the ratios determined for such county for the preceding quarter. In addition, the director shall determine the average ratio of all sales in all counties for the state for such twelve-month period. In determining the ratio of sales as required in this section, the director of property valuation shall, in all sales of property in which there is to be a change in the classification or subclassification of the property place such sale in the proper classification, or subclassification, and such sale resulting in a change of classification shall not be used in determining the ratio of the prior classification. Ratios for each twelve-month period shall be published annually by the director not later than the first day of December next following the close of such period, in convenient form for the use and information of the legislature, taxpayers and other interested parties and public officers. The annual report of the director of property valuation published as required by this section, shall include reports of county ratios of urban real estate and rural real estate, ratios for the classifications of property established by K.S.A. 79-503 and amendments thereto and ratios for a combination of all classes of property within each county. In addition thereto, such report shall include reports of state-wide average ratios of sales of urban real estate, sales of rural estate and of all sales in all counties of the state for the period hereinbefore prescribed."

Coefficient of Deviation
Kansas Statutes Annotated 79-1436b

"In taxable years commencing after December 31, 1978, whenever the director of property valuation shall determine that the coefficient of deviation for any one classification or subclassification of property in a county, as shown from the ratio studies, is greater than 20, he is authorized and directed to order all property within the classification or subclassification within such county to be reappraised."

APPENDIX II. SAMPLE DISTRIBUTIONS

Adequacy of the Comparable Sales Data

FIGURE 10.1

GEOGRAPHICAL DISTRIBUTION OF THE COMPARABLE SALES SAMPLE

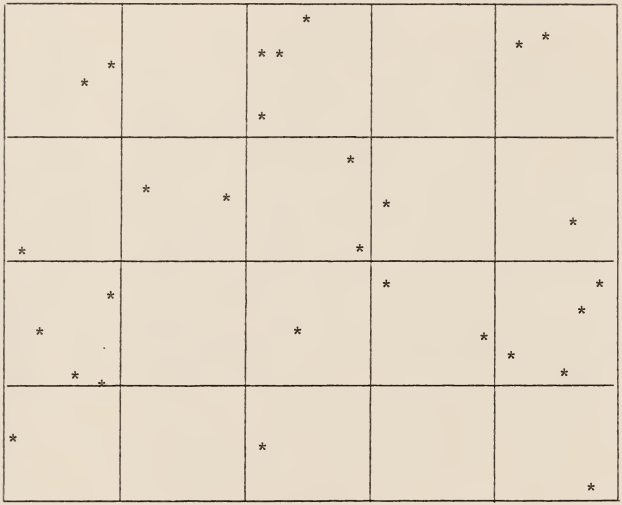


TABLE 10.1

SOIL ASSOCIATION DISTRIBUTION FOR THE SALES SAMPLE AND CLOUD COUNTY

Soil Association	County Acres by Association	Sample Acres by Association
Crete-Longford-Hedville	25%	27.6%
Kipson-Hastings-Armo	20	17.3
Hastings-Crete-Hord	20	24.1
Crete-Hastings-Hobbs	16	10.4
Muir-Carr-Humbarger	10	10.4
Lancaster-Hedville	4	3.4
Rorbury-New Cambria-McCook	3	3.4
Detroit-Sutphen-Bridgeport	2	3.4
	100	100.0

SOURCE: Soil Survey of Cloud County, Kansas, U.S.D.A. Soil Conservation Service and Kansas State University cooperating, 1976.

Adequacy of the Appraisal Sample

FIGURE 10.2

GEOGRAPHICAL DISTRIBUTION OF THE APPRAISAL SAMPLE

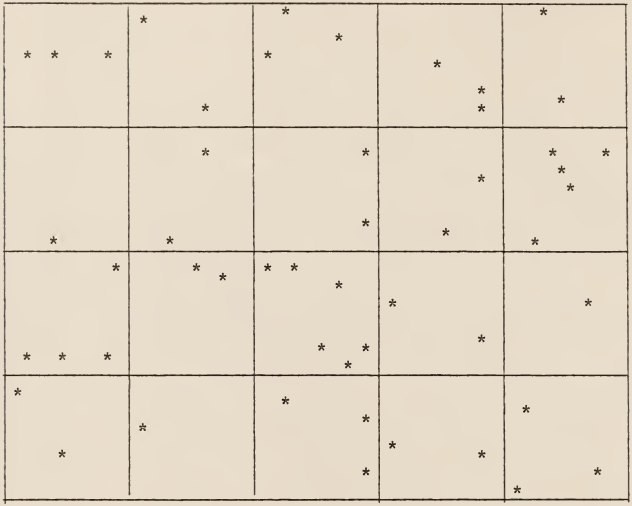


TABLE 10.2

SOIL ASSOCIATION DISTRIBUTION FOR THE APPRAISAL SAMPLE AND CLOUD COUNTY

Soil Association	County Acres by Association	Sample Acres by Association
Crete-Longford-Hedville	25%	19.6%
Kipson-Hastings-Armo	20	27.4
Hastings-Crete-Hord	20	21.6
Crete-Hastings-Hobbs	16	15.7
Muir-Carr-Humbarger	10	7.8
Lancaster-Hedville	4	2.0
Roxbury-New Cambria-McCook	3	2.0
Detroit-Sutphen-Bridgeport	2	3.9
	100	100.0

SOURCE: Soil Survey of Cloud County, Kansas, U.S.D.A. Soil Conservation Service and Kansas State University cooperating, 1976.

Use Value Methods

TABLE 11.1

SPEARMANS CORRELATION COEFFICIENTS FOR GENERAL SOIL CAPABILITY AND THE ALTERNATIVE METHODS OF ESTIMATING NET RETURNS TO DRYLAND

Comparison Orders	Correlation Coefficient	Significance (R)>0
Capability x Own/Oper. Meth.	.8655	*
Capability x Landlord's Meth.	.8488	*
Own/Oper. x Landlord's Meth.	.9625	*

*Correlation coefficient is significantly greater than zero at the $\alpha = .10$ level of significance.

TABLE 11.2

ANALYSIS OF VARIANCE FOR THE ALTERNATIVE METHODS OF ESTIMATING NET RETURN TO DRYLAND

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	F	Prob> F	Significant
Total Corrected	79	2959.5110				
General Capability	3	1546.1455	515.3818	55.05	.0001	*
Method	1	140.6375	140.6325	15.02	.0002	*
Cap X Meth. Interaction	3	80.8589	26.9530	2.88	.0412	*
Error	72	674.0711	9.3621			

*Indicates significant difference at the $\alpha = .10$ level of significance.

TABLE 11.3

MEAN NET RETURNS BY GENERAL CAPABILITIES AND ALTERNATIVE METHODS EMPLOYED TO ESTIMATE NET RETURNS TO DRYLAND

General Capability	Mean Net Returns		Significant
	Owner Operator	Landlord	
I	36.74	30.68	*
II	30.13	22.49	*
III	22.99	18.16	*
IV	11.36	12.22	-

*Indicates significant difference at the $\alpha = .10$ level of significance.

Yield Source

TABLE 11.4

ANALYSIS OF VARIANCE OF NET RETURNS ESTIMATED EMPLOYING ALTERNATIVE YIELD SOURCE DATA--OWNER OPERATOR METHOD FOR DRYLAND

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	F	Prob.> F	Significant
Corrected Total	159	4413.5791				
General Capability	3	2349.1268	783.0423	89.92	.0001	*
Yield Source	3	38.4876	12.8292	1.47	.2230	---
Cap. X Yield Interaction	9	796.6679	88.5187	10.17	.0001	*
Error	144	1253.9279	8.7078			

*Indicates probability> F is significant at the $\alpha = .10$ level.

TABLE 11.5

MEAN NET RETURNS FOR EACH YIELD SOURCE BY GENERAL CAPABILITY CLASSES--OWNER OPERATOR METHOD FOR DRYLAND

General Capability	Mean Yield Source Net Returns			
	County Average*	Appraised	Soil Type Predicted	Soil Type Adjusted
I	28.230	39.195	42.605	36.74
II	26.532	29.018	29.953	30.13
III	26.601	23.361	23.748	22.998
IV	26.460	18.000	12.245	11.36

*(1968-1975).

TABLE 11.6

ANALYSIS OF VARIANCE OF NET RETURNS ESTIMATED EMPLOYING ALTERNATIVE YIELD SOURCE DATA--LANDLORD METHOD FOR DRYLAND

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	F	Prob.> F	Significant
Total Corrected	159	2289.4417				
General Capability	3	1585.0412	528.3471	132.52	.0001	*
Method	3	8.0651	2.6884	.67	.5729	---
Cap. X Yield Interaction	9	128.7504	14.3056	3.59	.0005	*
Error	144	574.1254	3.9870			

*Indicates probability>F is significant at the α= .10 level.

TABLE 11.7

MEAN NET RETURNS FOR EACH YIELD SOURCE BY GENERAL CAPABILITY CLASSIFICATION--LANDLORD METHOD FOR DRYLAND

General Capability	Mean Yield Source Net Returns			
	County Average *	Appraised	Soil Type Predicted	Soil Type Adjusted
I	26.430	31.910	33.610	30.680
II	21.045	22.038	22.409	22.487
III	19.453	18.301	19.429	18.161
IV	17.240	14.420	12.505	12.215

*(1968-1975).

TABLE 11.8

YIELD SOURCE COMPARISONS OF MEAN NET RETURNS FOR DRYLAND

Owner Operator Method Comparisons	General Capability Classes			
	I	II	III	IV
County Average / Appraised	*	*	*	*
Appraised / Soil Type Predicted	-	-	-	*
Soil Type Predicted / Soil Type Adjusted	*	-	-	-
County Average / Soil Type Predicted	*	*	*	*
County Average / Soil Type Adjusted	*	*	*	*
Appraised / Soil Type Adjusted	-	-	-	*

Landlord Method Comparisons	General Capability Classes			
	I	II	III	IV
County Average / Appraised	*	-	*	-
Appraised / Soil Type Predicted	-	-	*	-
Soil Type Predicted / Soil Type Adjusted	-	-	*	-
County Average / Soil Type Predicted	*	*	-	*
County Average / Soil Type Adjusted	*	*	*	*
Apprised / Soil Type Adjusted	-	-	-	-

*Indicates significant difference at the $\alpha = .10$ level of significance.

Crop Mix

TABLE 11.9

ANALYSIS OF VARIANCE OF NET RETURN DIFFERENCES FOR THE EFFECT OF ALTERNATIVE CROP MIXES ON THE ALTERNATIVE METHODS OF ESTIMATING NET RETURN TO DRYLAND

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	F	Prob.>F	Significant
Corrected Total	79	88.1853				
Crop Mix	3	63.1058	21.0353	237.84	.0001	*
Methods	1	.7064	.7064	7.99	.0061	*
Mix X Method Interaction	3	13.5045	4.5015	50.90	.0001	*
Error	72	6.3680	.0884			

*Indicates significant difference at the $\alpha = .10$ level of significance.

TABLE 11.10

MEAN DIFFERENCE OF NET RETURNS EMPLOYING THE ALTERNATIVE CROP MIXES FOR EACH NET RETURN METHOD

Difference Groups by Appraisal Mix	Crop Mix Net Return Mean Differences	
	Owner Operator Method	Landlord Method
I 33% Wheat 33% Grain Sorghum 33% Alfalfa	-4.400	-1.395
II 60% Wheat 40% Grain Sorghum	1.460	.660
III 67% Wheat 33% Grain Sorghum	.953	.328
IV 75% Wheat 25% Grain Sorghum	.388	- .075
Mix Comparisons	Significant Difference	Significant Difference
I/II	*	*
II/III	*	*
III/IV	*	*

*Difference Comparisons are significantly different at the $\alpha = .10$ level.

TABLE 11.11

ANALYSIS OF VARIANCE FOR THE EFFECT OF ALTERNATIVE CROP MIXES ON GENERAL CAPABILITY--OWNER OPERATOR METHOD FOR DRYLAND

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	F	Prob.>F	Significant
Corrected Total	79	3020.8740				
General Capability	3	1951.0227	653.6742	46.30	.0001	*
Crop Mix Alternatives	1	0.1623	0.1623	.01	.9149	---
Cap. X. Mix Interaction	3	29.3479	9.7826	.69	.5628	---
Error	72	1016.4836	14.1178			

*Indicates probability>F is significant at the $\alpha = .10$ level.

TABLE 11.12

ANALYSIS OF VARIANCE FOR THE EFFECT OF ALTERNATIVE CROP MIXES ON GENERAL CAPABILITY--LANDLORD METHOD FOR DRYLAND

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	F	Prob.>F	Significant
Corrected Total	79	1290.7919				
General Capability	3	938.5377	312.8459	64.97	.0001	*
Crop Mix Alternatives	1	.0027	.0027	.00	.9813	---
Cap. X Mix Interactions	3	3.2535	1.0845	.23	.9779	---
Error	72	346.6988	4.8153			

*Indicates probability>F is significant at the $\alpha = .10$ level.

Leasing Arrangements

TABLE 11.13

ANALYSIS OF VARIANCE OF NET RETURNS ESTIMATED EMPLOYING ALTERNATIVE LEASING ARRANGEMENTS--LANDLORD NET CROP SHARE METHOD FOR DRYLAND

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	F	Prob > F	Significant
Corrected Total	79	930.7506				
General Capability	3	600.0883	200.0294	56.75	.0001	*
Leasing Arrangements	1	2.3827	2.3827	.68	.4137	-
Cap. X Lease Interaction	3	69.9316	23.3105	6.61	.006	*
Error	72	253.7628	3.5244			

*Indicates probability>F is significant at the α= .10 level of significance.

TABLE 11.14

MEAN NET RETURNS FOR LEASING ARRANGEMENT ALTERNATIVES BY CAPABILITY CLASSES--LANDLORD METHOD FOR DRYLAND

General Capability	Constant Arrangement	Appraisal Arrangements	Difference	Significant Difference
I	$24.010	30.680	-6.67	*
II	22.487	22.487	0	-
III	19.729	18.161	1.57	*
IV	15.015	12.215	2.80	-

*Indicates probability>F is significant at the α= .10 level of significance.

Periods of Years

TABLE 11.15

ANALYSIS OF VARIANCE OF NET RETURNS ESTIMATED EMPLOYING VARIOUS PERIODS OF YEARS--OWNER OPERATOR METHOD FOR DRYLAND

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	F	Prob>F	Significant
Corrected Total	159	26526.1255				
General Capability	3	5491.6957	1830.5652	121.44	.0001	*
Period of Years	3	4266.3415	1422.1138	94.35	.0001	*
Cap X Period Interaction	9	715.9019	79.5447	5.28	.0001	*
Error	144	2170.5425	15.0732			

*Indicates probability>F at α= .10 level of significance.

TABLE 11.16

MEAN NET RETURNS BY CAPABILITY CLASSES FOR VARIOUS PERIODS OF YEARS--OWNER OPERATOR METHOD FOR DRYLAND

General Capability	Mean Net Returns Per Acre			
	Appraised Future Income Stream	Historical Five-Year Average	Historical Eight-Year Average	Historical Ten-Year Average
I	$37.515	$48.290	$36.740	$31.150
II	10.704	43.417	30.134	24.305
III	3.879	33.769	22.998	18.116
IV	- 2.910	18.810	11.360	7.895

TABLE 11.17

ANALYSIS OF VARIANCE OF NET RETURNS ESTIMATED EMPLOYING VARIOUS PERIODS OF YEARS--LANDLORD METHOD FOR DRYLAND

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	F	Prob F	Significant
Corrected Total	159	5730.8424				
General Capability	3	2740.5579	913.5193	156.55	.0001	*
Periods of Years	3	722.5456	240.8485	41.27	.0001	*
Cap X Period Interaction	9	213.0031	23.6670	4.06	.0001	*
Error	144	840.2853	5.8353			

*Indicates probability F is significant at $\alpha = .10$ level.

TABLE 11.18

MEAN NET RETURN BY CAPABILITY CLASSES FOR VARIOUS PERIODS OF YEARS EMPLOYED--LANDLORD METHOD FOR DRYLAND

General Capability	Mean Net Returns Per Acre			
	Appraised Future Income Stream	Historical Five-Year Average	Historical Eight-Year Average	Historical Ten-Year Average
I	42.060	39.235	30.680	26.955
II	22.817	30.091	22.487	19.369
III	18.083	24.286	18.161	15.628
IV	13.540	16.660	12.215	10.42

TABLE 11.19

COMPARISONS OF MEAN NET REUTRNS FOR VARIOUS ALTERNATIVE PERIODS OF YEARS BY CAPABILITY CLASS

Owner Operator Comparisons	Capability Classes			
	I	II	III	IV
Future Income Stream / Five-Year Average	*	*	*	*
Five-Year Average / Eight-Year Average	*	*	*	*
Eight-Year Average / Ten-Year Average	-	*	*	-
Landlord Comparisons	**I**	**II**	**III**	**IV**
Future Income Stream / Five-Year Average	-	*	*	-
Five-Year Average / Eight-Year Average	*	*	*	*
Eight-Year Average / Ten-Year Average	-	*	*	-

*Indicates significant difference at the $\alpha = .10$ level of significance.

TABLE 11.20

ANALYSIS OF VARIANCE FOR NET RETURNS ESTIMATED
EMPLOYING ALTERNATIVE PERIODS OF YEARS-GRASSLAND

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	F	Prob>F	Significant
Corrected Total	147	305.0358				
Production Potential	3	2.1302	.7101	1.60	.1902	-
Period of Years	3	239.7794	79.9265	180.44	.0001	*
Pot X Period Interaction	9	.1516	.0168	.04	1.000	-
Error	132	58.4707	.4430			

*Indicates Probability>F is significant at the $\alpha = .10$ level of significance.

Market Value or Use Value

TABLE 11.21

ANALYSIS OF VARIANCE FOR USE VALUE/MARKET VALUE
PERCENTAGES - LANDLORD METHOD

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Squares	F	Prob>F	Significant
Corrected Total	101	48.7249				
Agricultural Use	3	6.4685	2.1562	42.53	.0001	*
Mkt. Value Estimates	1	15.5863	15.5864	307.46	.0001	*
Use X Estimates-Interaction	3	3.0390	1.0130	19.98	.0001	*
Error	94	4.7652	.0507			

*Indicates Probability>F is significant at the $\alpha = .10$ level of significance.

TABLE 11.22

MEAN PERCENTAGES OF USE VALUES AS A PERCENT OF CURRENT VALUATION AND AS A PERCENT OF APPRAISED VALUE - 9.25 PERCENT CAPITALIZATION

Current Agricultural Use	Owner Operator Method		Landlord Method	
	Percent of Current Valuation	Percent of Appraised Value	Percent of Current Valuation	Percent of Appraised Value
Irrigated Parcels	3.17	.66	2.05	.41
Dryland Parcels	2.36	.49	1.78	.37
Mixed Dryland Grassland Parcels	1.86	.41	1.56	.35
Grassland Parcels	.61	.16	.61	.16

TABLE 11.23

SIGNIFICANT DIFFERENCES FOR MEAN PERCENTAGE COMPARISONS CONDUCTED

Comparisons Conducted	Owner Operator Method		Landlord Method	
	Percent of Current Valuation	Percent of Appraised Value	Percent of Current Valuation	Percent of Appraised Value
Irrigated/Dryland	*	-	*	-
Dryland/Grass	*	*	*	*

	Alternative Agricultural Uses			
	Irrigated	Dryland	Mixed Dry Grass	Grassland
Owner Operator % Current / % Appraised Value	*	*	*	*
Landlord % Current / % Appraised Value	*	*	*	*

*Indicates significant difference at the $\alpha = .10$ level of significance.

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CASE STUDY: MARKET VALUE AND USE VALUE APPRAISAL OF AGRICULTURAL LAND FOR PROPERTY TAX PURPOSES IN CLOUD COUNTY, KANSAS

by

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Should market value or use value appraisal be employed for tax appraisal purposes of land devoted to agricultural use in Kansas? This thesis is designed to provide empirical evidence that will aid the policy decision-makers on this question.

A randomly selected sample of fifty-one parcels of agricultural land was studied in Cloud County, Kansas. Use value was estimated employing various factors, methods and data sources. Sensitivity of these factors was determined. On-the-spot appraisals based on market value according to current statutes were conducted. Use values were compared to current (1976) valuations on the tax roll, and to market value appraisals. Assessment appraisal ratios were calculated and compared to current assessment sales ratios.

The following findings were based on the data and methods employed in the study.

Use Value Factors: Cloud County dryland net returns employing an owner operator net income method are greater than net returns employing a landlord net crop share method for the time period studied (1968-1975).

Net returns employing county average yields result in underestimated extremes compared to other sources of yield data. Appraisal yields account for individual parcel characteristics and limitations not present in yield guidelines by soil type or county average yields. Soil survey predicted yields can result in underestimates or overestimates of yields compared to historical yield data.

Generally, dryland tracts with a higher capability class yield relatively higher net returns. Due to the nature of capability guidelines

and predicted yields, some class I soils yield lower net returns than other soils classed in lower capability.

Grassland tracts with more production potential based on soil survey range site classes do not necessarily merit higher rental rates. Cloud County average rental rates approximate the appraisal rental rates over all range sites.

Net returns employing a county average crop mix result in underestimation of extremes compared to appraisal crop mixes. The efforts were random over all capability classes, therefore the county average crop mix approximated the actual crop mix for the time period studied (1968-1975).

Net returns employing a constant dryland leasing arrangement underestimate extremes in net returns. Appraised leasing arrangements vary by capability class in Cloud County.

Longer periods of historical data currently result in lower net returns to agricultural land. If future income streams are relatively low compared to previously high years, then longer periods would result in higher net returns.

Market or Use Value: Use value for tax purposes increases valuations of cropland for the time period studied (1968-1975). Use value actually decreases valuation of grassland. The extent is a function of current levels of assessment, capitalization rate employed, and net returns employed.

Use value does not increase valuations of agricultural land to the level of reappraisal under market value.

Assessment Ratio Comparisons: Median assessment sales ratios approximate median assessment market value appraisal ratios for

agricultural land. However, sales ratios exhibit more variation than do appraisal ratios for the time period studied.

Median assessment use value ratios approximate the thirty percent assessment rate under procedures employed. However, extreme use values can be underestimated employing procedures similar to a Kansas interim legislative proposal H.B. 2732.